

# StorageTek Virtual Operator Panel

---

User's Guide

Version 2.0.1



Part Number: E37053-01  
September 2012

Submit comments about this document to [STP\\_FEEDBACK\\_US@ORACLE.COM](mailto:STP_FEEDBACK_US@ORACLE.COM).

Oracle welcomes your comments and suggestions for improving this book. Contact us at [STP\\_FEEDBACK\\_US@ORACLE.COM](mailto:STP_FEEDBACK_US@ORACLE.COM). Please include the title, part number, issue date, and revision.

Copyright © 2012, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related software documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications which may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure the safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. UNIX is a registered trademark licensed through X/Open Company, Ltd.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

---

---

# Table of Contents

<b>List of Figures</b>	7
<b>List of Tables</b>	9
<b>Preface</b>	11
Access to Oracle Support	11
<b>1 Introduction</b>	13
<b>2 Requirements</b>	15
User Roles	15
System Requirements	15
Operating System Requirements	15
Additional System Requirements	16
Java Runtime Environment Requirement	16
Library and Tape Drive Requirements	16
MD-VOP Library Support	16
MD-VOP Tape Drive Support	17
MD-VOP Placeholder Tape Drive Support	17
MD-VOP ASR Capable Drive Support	18
T10000 9840D VOP Drive Support	18
LTO VOP Drive Support	18
9XXX VOP Drive Support	19
Configuration Considerations	19
Ethernet Connection to the Drive	19
Service Network	19
Additional Considerations	20
Related Publications	20
<b>3 Obtaining VOP</b>	21
To Obtain VOP	21
<b>4 Installing VOP</b>	23
Default VOP Installation and File Directories	23
System Administrator Version	23
Operator Version	24
Installing VOP	25

To Install VOP .....	25
Un-Installing VOP .....	28
To Un-Install VOP (Windows) .....	28
To Un-install VOP (UNIX) .....	28
<b>5 Starting VOP .....</b>	<b>29</b>
Starting MD-VOP .....	29
Starting MD-VOP (Windows) .....	29
Starting MD-VOP (UNIX) .....	29
Launching MD-VOP for the First Time .....	30
Starting T10000 9840D VOP .....	31
To Start T10000 9840D VOP Within MD-VOP .....	31
To Start T10000 9840D VOP from the Desktop .....	31
Starting LTO VOP.....	32
To Start LTO VOP Within MD-VOP .....	32
To Start LTO VOP from the Desktop .....	32
Starting 9XXX VOP .....	33
To Start 9XXX VOP Within MD-VOP .....	33
To Start 9XXX VOP from the Desktop .....	33
<b>6 Using the MD-VOP Interface .....</b>	<b>35</b>
MD-VOP Interface Overview .....	35
Dashboard .....	37
Library Panel .....	39
MD-VOP Drive Views.....	43
Drive State View .....	44
Encryption View .....	46
Drive Health View .....	48
MD-VOP Transcript .....	50
SDVOP View .....	51
ASR .....	52
<b>7 Using MD-VOP Dashboard Menus .....</b>	<b>57</b>
File Menu .....	57
Help Menu .....	59
Using the MD-VOP Configuration Screen .....	60
Library Spreadsheet Page .....	62
Configuration Menus .....	66
Using Probe Commands .....	69
Changing MD-VOP Default Settings .....	74
Misc Display Settings .....	75
Drive State Display Settings .....	76
Encryption Display Settings .....	78
Drive Health Display Settings .....	79
<b>8 Using MD-VOP Library Panel Menus .....</b>	<b>81</b>
File Menu .....	82
Drive Operations Menu .....	83
Retrieve Menu .....	84
Configuration Menu .....	85

Performing a Firmware Update .....	85
Encryption Menu .....	88
Encryption Command Requirements .....	90
Reports Menu .....	92
<b>9 Using T10000 9840D VOP .....</b>	<b>93</b>
T10000 9840D VOP Interface .....	94
Using T10000 9840D VOP Menus .....	95
File Menu .....	96
Drive Operations Menu .....	97
Retrieve Menu .....	101
Configure Menu .....	103
Help Menu .....	112
<b>10 Using LTO VOP .....</b>	<b>113</b>
LTO VOP Interface .....	114
Changing the Online/Offline Status of a Drive.....	116
To Change Drive Status to Offline .....	116
Error Messages .....	116
LTO VOP Function Tabs .....	117
Monitor Drive .....	117
Enroll Drive .....	119
Configure Drive .....	121
Service Drive .....	123
IBM Service Tools .....	125
<b>11 Using 9XXX VOP .....</b>	<b>127</b>
9XXX VOP Interface.....	128
Using 9XXX VOP Menus .....	129
File Menu .....	129
Drive Operations Menu .....	130
Retrieve Menu .....	131
Configure Menu .....	132
Help Menu .....	133
Using Menu and Select Switches .....	134
Menu Button .....	134
Select Button .....	135
<b>A Changing the Default MD-VOP User File Directory .....</b>	<b>137</b>
Windows .....	137
UNIX.....	138
<b>Glossary .....</b>	<b>139</b>
<b>Index .....</b>	<b>147</b>



---

## List of Figures

<b>FIGURE 5-1</b>	MD-VOP Default Screen .....	30
<b>FIGURE 6-1</b>	MD-VOP Main Interface .....	36
<b>FIGURE 6-2</b>	MD-VOP Dashboard .....	37
<b>FIGURE 6-3</b>	MD-VOP Library Panel .....	39
<b>FIGURE 6-4</b>	Drive State View Example .....	44
<b>FIGURE 6-5</b>	Drive State Legend .....	45
<b>FIGURE 6-6</b>	Encryption View Example .....	46
<b>FIGURE 6-7</b>	Encryption Legend .....	47
<b>FIGURE 6-8</b>	Drive Health View Example .....	48
<b>FIGURE 6-9</b>	Drive Health View Legend .....	49
<b>FIGURE 6-10</b>	MD-VOP Transcript View Example .....	50
<b>FIGURE 6-11</b>	SDVOP View Example .....	51
<b>FIGURE 6-12</b>	ASR View Example .....	52
<b>FIGURE 7-1</b>	MD-VOP Configuration Screen .....	60
<b>FIGURE 7-2</b>	Library Spreadsheet Page .....	62
<b>FIGURE 7-3</b>	Manual Drive Placement Screen .....	71
<b>FIGURE 7-4</b>	MD-VOP Default Settings Screen .....	74
<b>FIGURE 7-5</b>	Drive State Display Settings .....	76
<b>FIGURE 7-6</b>	Encryption Display Settings .....	78
<b>FIGURE 7-7</b>	Drive Health Display Settings .....	79
<b>FIGURE 8-1</b>	Firmware Update Progress Dialog .....	86
<b>FIGURE 8-2</b>	OKM Save Certificates Dialog .....	91
<b>FIGURE 9-1</b>	T10000 9840D VOP Interface .....	94
<b>FIGURE 9-2</b>	Tape Cartridge Write Protect Switch .....	100
<b>FIGURE 10-1</b>	LTO VOP Interface .....	114
<b>FIGURE 10-2</b>	LTO VOP Monitor Drive tab .....	117
<b>FIGURE 10-3</b>	LTO VOP Enroll tab .....	119
<b>FIGURE 10-4</b>	LTO VOP Configure Drive tab .....	121
<b>FIGURE 10-5</b>	LTO VOP Service Drive tab .....	123
<b>FIGURE 10-6</b>	LTO VOP About Dialog .....	124
<b>FIGURE 10-7</b>	LTO VOP IBM Service Tools tab .....	125
<b>FIGURE 11-1</b>	9XXX VOP Interface .....	128
<b>FIGURE 11-2</b>	9XXX VOP Menu Switch .....	134
<b>FIGURE 11-3</b>	9XXX VOP Select Switch .....	135



---

## List of Tables

<b>TABLE 2-1</b>	MD-VOP Library Support .....	16
<b>TABLE 2-2</b>	MD-VOP Tape Drive Support .....	17
<b>TABLE 2-3</b>	MD-VOP Placeholder Tape Drive Requirements .....	17
<b>TABLE 2-4</b>	T10000 9840D VOP Tape Drive Support .....	18
<b>TABLE 2-5</b>	LTO VOP Tape Drive Support.....	18
<b>TABLE 2-6</b>	9XXX Tape Drive Support .....	19



---

# Preface

This publication describes how to use Oracle's StorageTek Virtual Operator Panel (VOP) to monitor and control tape drives. It is intended for system administrators and operators.

## Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support:

<http://www.oracle.com/support/contact.html>

<http://www.oracle.com/accessibility/support.html> (for hearing impaired)



---

## Introduction

Oracle's StorageTek Virtual Operator Panel (VOP) is a suite of software applications that allow you control and monitor the functionality of different tape drives. VOP applications provide an intuitive and user-friendly graphical user interface (GUI) to display drive-related information, to configure the drive, or to perform various drive operations. VOP is designed for customers who have an existing Oracle service contract for their tape drives and libraries.

VOP includes the following applications:

- **Multi-Drive Virtual Operator Panel (MD-VOP)**

This application allows you control and monitor a variety of tape drives in multiple libraries.

MD-VOP supports the following StorageTek libraries:

- SL8500
- SL3000
- SL500
- L700/L1400
- 9310

MD-VOP supports the following tape drives:

- StorageTek T10000A, T10000B, and T10000C
- StorageTek T9840D
- HP and IBM LTO-4 and LTO-5 (encryption capable)

- **T10000 9840D VOP**

This application allows you to control and monitor a single Oracle StorageTek T10000A, T10000B, T10000C, or T9840D tape drive.

- **LTO VOP**

This application allows you to control and monitor a single encryption-enabled HP or IBM Linear Tape Open (LTO) Ultrium LTO-4 or LTO-5 tape drive.

- **9XXX VOP**

This application allows you to control and monitor a single Ethernet-connected Oracle StorageTek T9x40 series tape drive.

**Note –** You can access the single-drive VOP applications within the MD-VOP interface, or run them as standalone applications. However, you must install MD-VOP, as the single-drive VOP applications are installed as part of the MD-VOP installer.

---

## Requirements

This chapter describes VOP pre-installation requirements.

### User Roles

VOP is available in two versions, designed for the following customer roles:

- System Administrator

This version of VOP is designed for the system administrator who configures and controls the VOP configuration.

- Operator

This version of VOP is designed for the operator who monitors the configuration. In this version, the operator can only manipulate a single tape drive at one time.

### System Requirements

#### Operating System Requirements

VOP is supported on the following operating systems:

- Linux Kernel (2.6.18 or later), Redhat 9.0, ES
- Solaris 10 (Sparc and x86)
- Microsoft Windows 2000, XP (with Service Pack 3), or Windows 7

The VOP package includes separate installers for each of these operating systems.

## Additional System Requirements

The following are required:

- 1 GHz processor
- Disk Space: Approximately 150 MB
- Memory: 512 MB
- Monitor screen resolution 1024x768 (minimum)
- Available Ethernet port for static IP addressing
- RJ45-RJ45 Ethernet cross-over cables (direct connection to a tape drive or drive tray)
- RJ45-RJ45 Ethernet cables (connection through an Ethernet switch)

## Java Runtime Environment Requirement

VOP applications are Java-based. During installation, a local copy of the Java Runtime Environment (JRE) is placed in the installation directory for exclusive use by the VOP applications.

VOP requires JRE version 1.5 or higher.

## Library and Tape Drive Requirements

### MD-VOP Library Support

MD-VOP supports multiple tape drives at the library level.

The following table lists libraries supported by MD-VOP, along with required minimum firmware levels:

**TABLE 2-1** MD-VOP Library Support

Library/Component	Minimum Firmware Requirement
SLS8500	FRS 4.70, FRS 4.14, FRS3.98b
SL3000	FRS 2.05, FRS 2.30
SL500	V1373
L700/L1400	3.18.02
9310	All
Library Console	FRS 4.00

## MD-VOP Tape Drive Support

The following table lists tape drives supported by MD-VOP, along with required minimum firmware levels:

**TABLE 2-2** MD-VOP Tape Drive Support

Tape Drive	Minimum Firmware Requirement
T10000A	1.44.111
T10000B	1.44.211
T10000C	1.51.316
T9840D	1.45.703
HP LTO4*	H58S (Fibre Channel) B57S (SCSI)
IBM LTO4*	94D7
HP LTO 5*	I5BS
IBM LTO 5*	BBNH/2.36.23

\* LTO encryption-capable tape drives only

## MD-VOP Placeholder Tape Drive Support

You can manually add tape drives to the MD-VOP configuration in order to provide placeholders as an indication that there is a tape drive in a particular slot.

The following table lists supported placeholder tape drives, along with required minimum firmware levels:

**Note –** 9XXX drives are non-reactive. You can obtain logs for these drives, however, they do not show loaded/unloaded state.

**TABLE 2-3** MD-VOP Placeholder Tape Drive Requirements

Tape Drives	Minimum Firmware Version
T9840B, T9840C, T9940A, T9940B**	<ul style="list-style-type: none"> <li>T9840B - 1.44.310</li> <li>T9840C - 1.45.503</li> <li>T9940B - 1.44.410</li> </ul>
LTO 2/3/4 (non encrypting) and T9840A***	N/A

\*\* Placeholders that can be located in a library using the probe operation.

\*\*\* Placeholders located manually in a library.

## MD-VOP ASR Capable Drive Support

MD-VOP allows the user to create a service request in My Oracle Support (MOS) and automatically transmit logs for Oracle Support review. The following devices are supported:

- Oracle StorageTek SL8500, SL3000, and SL500 libraries
- Oracle StorageTek T9x40 and T10000 series tape drives

This feature requires a valid service contract. Also, devices must be activated in MOS for processing. See [“ASR” on page 52](#) for more information about this feature.

## T10000 9840D VOP Drive Support

The following table lists tape drives supported by T10000 9840D VOP, along with required minimum firmware levels:

**TABLE 2-4** T10000 9840D VOP Tape Drive Support

Tape Drive	Minimum Firmware Requirement
T10000A	1.44.111
T10000B	1.44.211
T10000C	1.51.316
T9840D	1.45.703

## LTO VOP Drive Support

The following table lists tape drives supported by LTO VOP, along with required minimum firmware levels:

**TABLE 2-5** LTO VOP Tape Drive Support

Tape Drive	Minimum Firmware Requirement
HP LTO4*	H58S (Fibre Channel) B57S (SCSI)
HP LTO 5*	I5BS
IBM LTO4*	94D7
IBM LTO 5*	BBNH/2.36.23

\* LTO encryption-capable tape drives only

## 9XXX VOP Drive Support

The following table lists tape drives supported by 9XXX VOP, along with required minimum firmware levels:

**TABLE 2-6** 9XXX Tape Drive Support

Tape Drive	Minimum Firmware Requirement
T9840B, T9840C	<ul style="list-style-type: none"> <li>• T9840B - 1.44.310</li> <li>• T9840C - 1.45.503</li> <li>• T9940B - 1.44.410</li> </ul>
T9940A, T9940B	T9940B - 1.44.410

## Configuration Considerations

### Ethernet Connection to the Drive

To use VOP with a drive, you must have an Ethernet connection from your computer to the Ethernet port on the tape drive or drive tray rear panel.

- For a direct connection to the drive, you must use a single crossover Ethernet cable.
- For an indirect connection (through an Ethernet switch), you must use a straight Ethernet cable to connect your computer to the switch. The switch-to-drive cable should already be connected.

### Service Network

VOP is designed to operate on the service network configured as a **private** LAN. It uses the service network Ethernet port for communications. This port can also be used by other applications, such as:

- Oracle Key Manager (OKM), formerly Key Management System (KMS), used for secure encryption of tape drives.
- Oracle Service Delivery Platform (SDP), used for delivery of fast and accurate service.

The private LAN recommendation ensures security from unauthorized access. Refer to the *Oracle Key Manager Systems Assurance Guide* for more information about the service network.

## Additional Considerations

- When configuring the tape drive network, adhere to the guidelines included in your tape drive publications. A qualified service representative should implement the tape drive network.
- If MD-VOP is the only program installed, the following are recommended:
  - Connect the tape drive Ethernet port on a private network.
  - Use static IP addresses, not dynamic addresses.
  - Use Level 2 switches to isolate each library (highly recommended)
  - Ensure that the latest firmware is loaded on all tape drives.
- The IP address for a new tape drive defaults to 10.0.0.1. When you configure the network and tape drives, be sure to configure one tape drive at a time as you add them to the network.
- MD-VOP configuration requires a unique IP address to be assigned for each tape drive.
- If the configuration environment includes SDP, contact your SDP service representative to assist in assigning IP addresses.

## Related Publications

Refer to the following publications for more information about various topics related to VOP:

- *Oracle StorageTek T9840 Tape Drive User's Guide*
- *Oracle StorageTek T9x40 Service Reference Manual*
- *Oracle StorageTek T10000 Tape Drive Operator's Guide*
- *Oracle StorageTek T10000 Tape Drive Installation Manual*
- *Oracle StorageTek T10000 Tape Drive Service Manual*
- *Oracle StorageTek T10000 Fibre Channel Interface Reference Manual*
- *Oracle StorageTek T10000A Encrypting Tape Drive Security Policy*
- *Oracle StorageTek T10000B Encrypting Tape Drive Security Policy*
- *Oracle StorageTek T10000C Encrypting Tape Drive Security Policy*
- *Oracle Key Manager (OKM) Installation Guide*
- *Oracle Key Manager (OKM) Administration Guide*
- *Oracle Key Manager (OKM) Systems Assurance Guide*

To access these publications, visit the Oracle Technical Network (OTN) at the following URL:

<http://oracle.com/technetwork/indexes/documentation/index.html>

---

## Obtaining VOP

This chapter describes how to obtain VOP.

**Note** – VOP includes StorageTek MD-VOP, along with the T10000 9840D VOP, LTO VOP, and 9XXX VOP single drive applications. You can access these applications within the MD-VOP interface, or run them as standalone applications.

### ▼ To Obtain VOP

1. **Create a local destination folder for the VOP download.**

If you are using Linux or UNIX, create this folder as a direct subordinate to the root (home folder).

2. **Launch your web browser and access Oracle's Software Delivery Cloud at the following URL:**

<http://edelivery.oracle.com>

3. **On the Welcome page, click Sign In/Register.**
4. **Enter the Username (ID) and Password provided by your Oracle support representative and then click Sign In.**
5. **On the Terms & Restrictions page, read the License Agreement and Export Restrictions, and select the check boxes to indicate your acceptance. Then click Continue.**
6. **On the Media Pack Search page, perform the following steps:**
  - a. **Click the Select a Product Pack pull-down menu, and select Oracle StorageTek Products.**
  - b. **Click the Platform pull-down menu, and select Generic Platform.**
  - c. **Click Go.**
7. **In the list of available products, select Oracle StorageTek Virtual Operator Panel (VOP) and click Continue.**
8. **Click Download and save the media pack .zip file to the destination folder you created in [Step 1](#).**

**9. Use an unzip utility to extract the VOP files from the zip file.**

Separate VOP installers for Windows, Solaris Sparc, Solaris x86 and Linux86 platforms are extracted. You may delete those installers that do not apply.

A Readme file is also included. Read this document before installing and using VOP.

---

## Installing VOP

This chapter describes how to install and uninstall VOP applications.

### Default VOP Installation and File Directories

The following sections list the default installation and user file directories used by VOP, based upon the version installed.

**Note** – You can specify a different installation directory during the installation process. You can also modify MD-VOP launch scripts to change the default user file directory. See [“Changing the Default MD-VOP User File Directory” on page 137](#) for more information.

### System Administrator Version

**Note** – *User* is the user name currently logged in.

#### Windows Platform:

VOP is installed in the following directory:

`C:\Program Files\Multi Drive VOP SysAdmin`

VOP stores user created files in the following directory:

`Documents and Settings/User/.mdvop`

#### All Other Platforms:

VOP is installed under the *User* home directory, in a sub-directory named `mdvop_sys`.

VOP stores user created files under the *User* home directory, in a sub-directory named `.mdvop`.

## Operator Version

**Note** – *User* is the user name currently logged in.

### Windows Platform:

VOP is installed in the following directory:

`C:\Program Files\Multi Drive VOP Operator`

VOP stores user created files in the following directory:

`Documents and Settings/User/.mdvop`

### All Other Platforms:

VOP is installed under the *User* home directory, in a sub-directory named `mdvop_operator`.

VOP stores user created files under the *User* home directory, in a sub-directory named `.mdvop`.

## Installing VOP

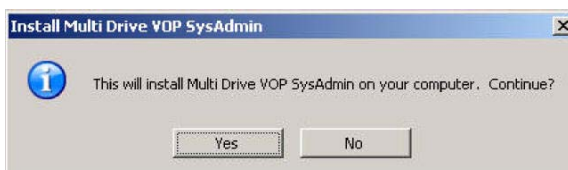
The VOP installer automatically installs MD-VOP, along with the following single-drive VOP applications:

- T10000 9840D VOP
- LTO-VOP
- 9XXX VOP

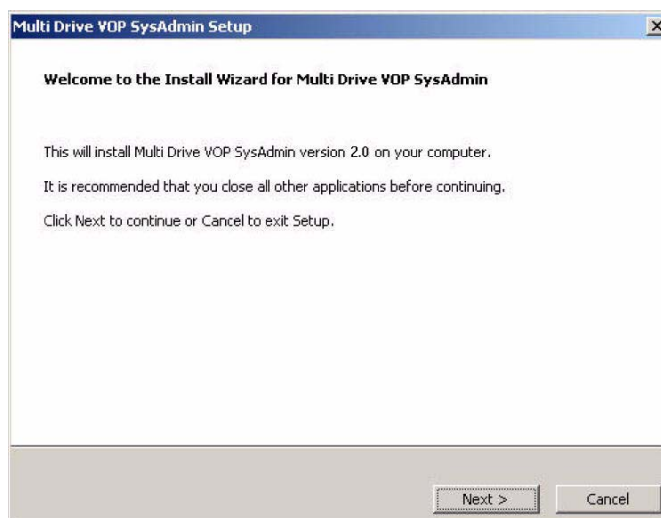
During installation, you may choose whether to create desktop shortcuts for each VOP application.

### ▼ To Install VOP

1. Navigate to the folder that contains the VOP installer files you downloaded in [Chapter 3, “Obtaining VOP”](#).
2. Run the appropriate installer for your operating system.
  - For Windows, double-click the executable (.exe) Windows file.
  - For UNIX, enter `./filename` from a terminal screen, where *filename* is the MD-VOP install file you wish to run.
3. When the initial dialog box appears, click Yes to continue.



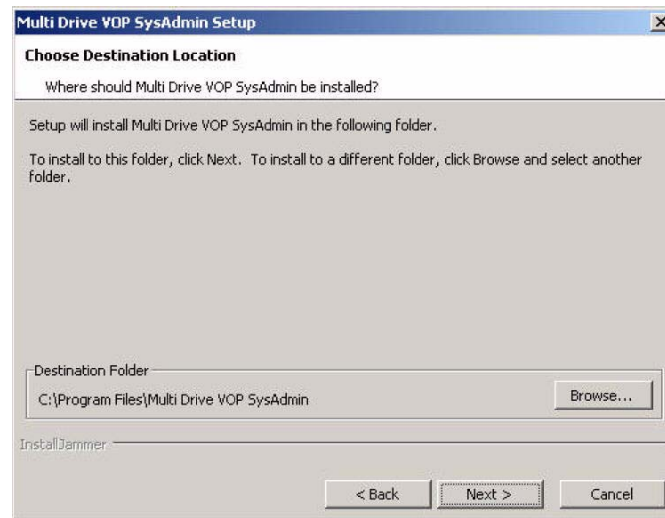
4. When the Welcome screen appears, click Next to continue.



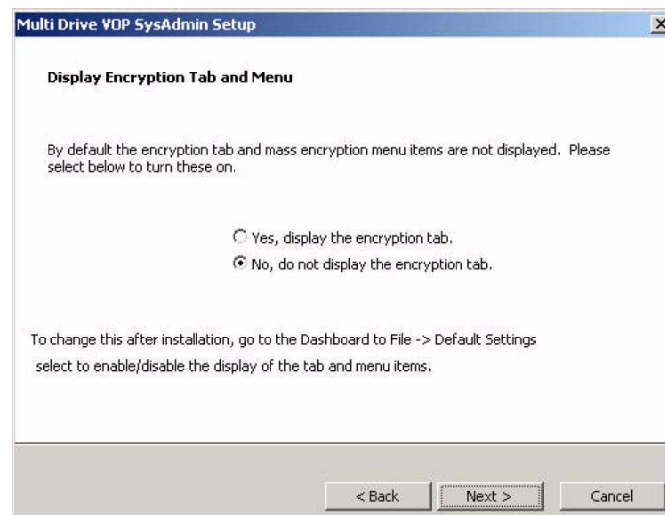
5. Read the license agreement and click the check box to accept it. Then click Next to continue.

**Note** – If a previous version of MD-VOP is detected on your system, the program prompts you to remove the previous version. This is recommended, as running multiple versions of MD-VOP at one time may cause unpredictable results.

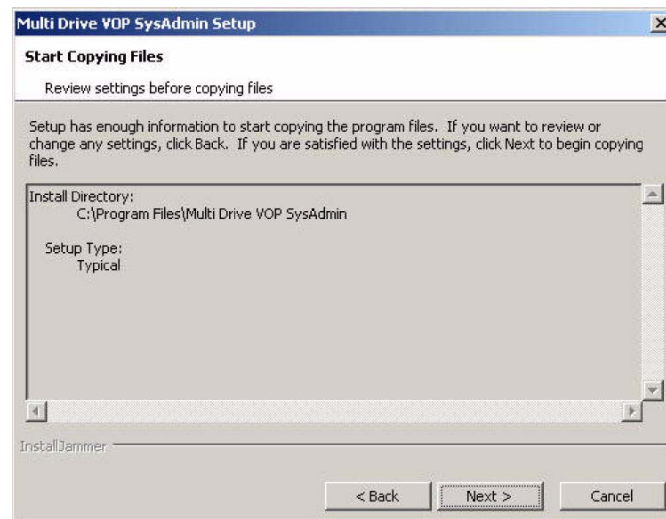
6. Specify the desired destination folder for installation. Then click Next to continue.



7. Select whether to display the encryption tab in this installation of MD-VOP. Then click Next to continue.

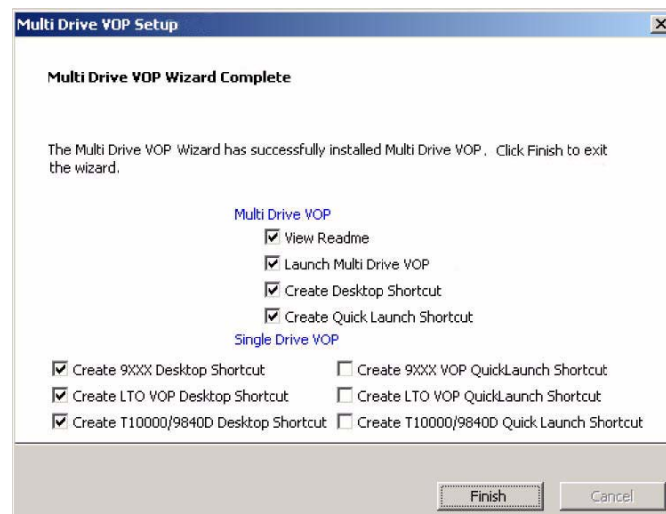


8. Confirm your setup options and click Next to begin installation.



**Note** – Please wait as VOP installs. A status bar appears to indicate installation progress.

9. Select your environment options and then click Finish.



Environment options include the following:

Multi-Drive VOP:

- View ReadMe - Displays the MD-VOP ReadMe file.
- Launch Multi-Drive VOP - Starts MD-VOP after installation is complete.
- Create Desktop Shortcut - Creates an MD-VOP desktop shortcut.
- Create Quick Launch Shortcut - Creates an MD-VOP icon in the Quick Launch toolbar.

Single Drive VOP:

- Create 9XXX VOP Desktop Shortcut
- Create 9XXX VOP Quick Launch Shortcut (Windows only)
- Create LTO VOP Desktop Shortcut
- Create LTO VOP Quick Launch Shortcut (Windows only)
- Create T10000 9840D Desktop Shortcut
- Create T10000 9840D VOP Quick Launch Shortcut (Windows only)

**10. Installation is complete.**

- If you selected Launch Multi-Drive VOP in the previous step, the MD-VOP application launches. See [“Launching MD-VOP for the First Time” on page 30](#).
- If you did not select Launch Multi-Drive VOP in the previous step, the installer closes. See [Chapter 5, “Starting VOP”](#).

## Un-Installing VOP

**Note** – All configurations and logs are retained after VOP is removed.

### ▼ To Un-Install VOP (Windows)

1. Exit all running instances of VOP.
2. Perform one of the following steps:
  - From the Windows Start Menu, select **All Programs**, then **Multi-Drive Virtual Operator Panel**, and finally, **Uninstall Multi-Drive Virtual Operator Panel**.
  - From the VOP installation directory, run **uninstall.exe**.
3. An Uninstall Confirmation dialog appears. Click **Yes** to uninstall VOP.
4. When uninstall is complete, a confirmation screen appears.

### ▼ To Un-install VOP (UNIX)

1. Exit all running instances of VOP.
2. Enter the following command:

```
# cd <parent directory above the VOP installation directory>
```

**Note** – You must be one level above the installation directory. Otherwise, the terminal will lose the path.
3. Enter the following command:

```
# ./mdvop_sys/uninstall
```
4. When uninstall is complete, a confirmation screen appears.

---

## Starting VOP

This chapter describes how to start VOP applications.

**Note** – Single-drive VOP applications may be started within MD-VOP, or separately as standalone applications.

### Starting MD-VOP

#### Starting MD-VOP (Windows)

To start MD-VOP, do one of the following:

- Click the Windows Start menu and select **All Programs, Multi-Drive VOP**, and then **Multi Drive VOP**.
- Double-click the Multi-Drive VOP desktop shortcut (optionally enabled during installation).
- Double-click the Multi-Drive VOP Quick Launch shortcut icon (optionally enabled during installation).

When you start MD-VOP, there is a minimal delay as the application starts. During loading, a progress bar appears. There may be an additional delay as VOP connects to tape drives and determines the current state of the tape drive(s).

#### Starting MD-VOP (UNIX)

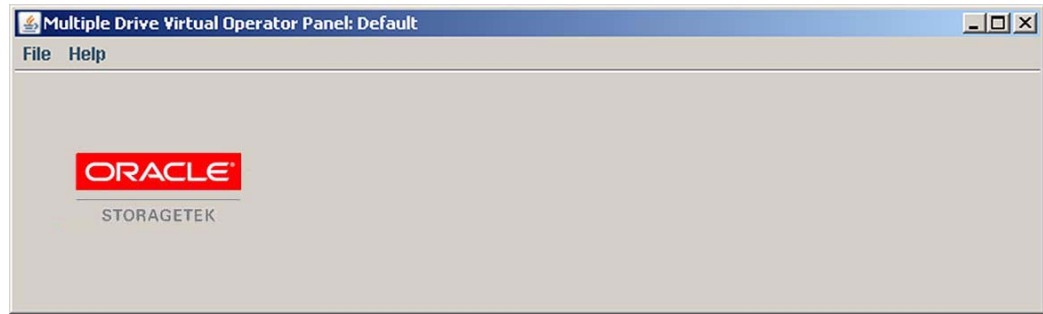
To start MD-VOP, do one of the following:

- Run the file named `mdvop` from the installation directory. (Use a relative path, symbolic links, or add the VOP directory to your `$PATH` environmental variable.)
- Double click the Multi-Drive VOP desktop icon (if supported).

## Launching MD-VOP for the First Time

When you launch MD-VOP for the first time, the following MD-VOP Default screen appears:

**FIGURE 5-1** MD-VOP Default Screen



**Note –** This screen also appears if you have not defined an existing configuration as the default.

- To create a new MD-VOP configuration, click the File menu and select **Edit Configuration**.

A default Configuration screen appears. See [“Using the MD-VOP Configuration Screen” on page 60](#) for more information about creating a new configuration.

- To open an existing MD-VOP configuration, click the File menu and select **Launch Configuration**.

The MD-VOP interface appears and the configuration opens. See [Chapter 6, “Using the MD-VOP Interface”](#) for more information.

## Starting T10000 9840D VOP

You can start T10000 9840D VOP either from within the MD-VOP application, or from the desktop.

### ▼ To Start T10000 9840D VOP Within MD-VOP

To start T10000 9840D VOP within MD-VOP, do one of the following:

- Click on a T10000 or T9840D tape drive icon displayed in the Library Panel. The SDVOP view for that tape drive is displayed in the MD-VOP interface.
- Click the File menu and select **Launch Single Drive T10000/9840D VOP**.

An authentication dialog box appears. To connect to a tape drive, enter the IP address of the connected tape drive, and click the **Connect** button. Otherwise, click **Cancel** to exit the application.

### ▼ To Start T10000 9840D VOP from the Desktop

**Note** – A physical connection between your processing platform and the Ethernet port on the tape drive is assumed.

1. Double-click the T10000 9840D VOP desktop icon (if specified during installation). An Authentication dialog box appears.
2. Enter the IP address of the physically-connected tape drive, and click the **Connect** button. Otherwise, click **Cancel** to exit the application.

## Starting LTO VOP

You can start LTO VOP either from within the MD-VOP application, or from the desktop.

### ▼ To Start LTO VOP Within MD-VOP

To start LTO VOP within MD-VOP, do one of the following:

- Click on an LTO tape drive icon displayed in the Library Panel. The SDVOP view for that tape drive is displayed in the MD-VOP interface.
- Click the File menu and select **Launch Single Drive LTO VOP**.

The LTO VOP interface appears.

- a. Enter the IP address of the tape drive Ethernet port in the field next to the Connect button.
- b. Click the **Connect** button.

### ▼ To Start LTO VOP from the Desktop

**Note –** A physical connection between your processing platform and the Ethernet port on the tape drive is assumed.

1. **Double-click the LTO VOP desktop icon (if specified during installation). The LTO VOP interface appears.**

Because LTO VOP is not yet communicating with a tape drive, the Connect button is grey and all status indicators are black.

2. **Enter the IP address of the tape drive Ethernet port in the field next to the Connect button.**
3. **Click the Connect button.**

Once connection is established, The IP address appears in the title bar, the status indicators are no longer black, and data appears in the Monitor Drive tab.

# Starting 9XXX VOP

You can start 9XXX VOP either from within the MD-VOP application, or from the desktop.

## ▼ To Start 9XXX VOP Within MD-VOP

To start 9XXX VOP within MD-VOP, do one of the following:

- Click on a T9x40B or T9x40C tape drive icon displayed in the Library Panel. The SDVOP view for that tape drive is displayed in the MD-VOP interface.
- Click the File menu and select **Launch Single Drive 9XXX VOP**.

The 9XXX VOP interface appears.

- a. Click the File menu and select **Connect to Drive**. The Connect to Drive dialog box appears.
- b. Enter the IP address of a T9x40B or T9x40C tape drive, and click the **Connect** button. Otherwise, click **Cancel** to exit the dialog box.

## ▼ To Start 9XXX VOP from the Desktop

**Note –** A physical connection between your processing platform and the Ethernet port on the tape drive is assumed.

1. Double-click the 9XXX VOP desktop icon (if specified during installation). The 9XXX VOP interface appears.
2. Click the File Menu and select **Connect to Drive**. The Connect to Drive dialog box appears.
3. Enter the IP address of the physically-connected T9x40B or T9x40C tape drive, and click the **Connect** button. Otherwise, click **Cancel** to exit the dialog box.

Starting 9XXX VOP

---

## Using the MD-VOP Interface

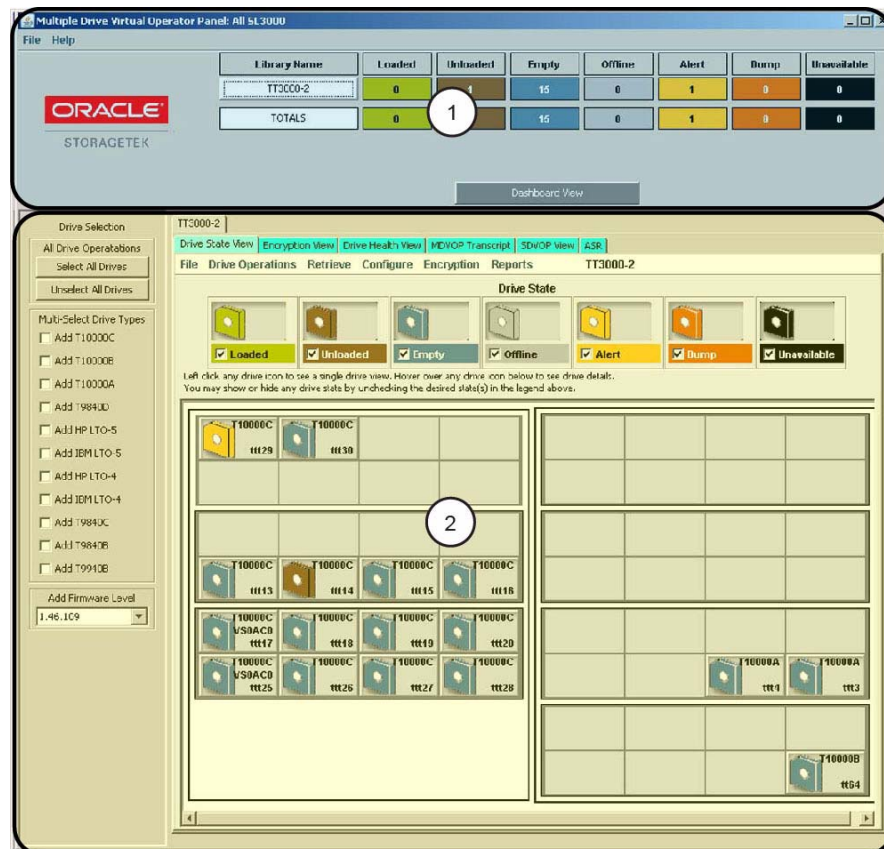
### MD-VOP Interface Overview

Designed for ease of use, the MD-VOP Graphical User Interface (GUI) allows you to do the following:

- Navigate through multiple account configurations, including libraries and tape drives.
- Monitor, configure, and diagnose Oracle StorageTek tape drives.
- View the current state of all tape drives in order to monitor problems as they occur.
- Perform mass functions for multiple tape drives, including firmware updates, obtaining logs and dumps, and encryption.
- Create My Oracle Service (MOS) issues using the Auto Service Request (ASR) feature.

The following figure shows the MD-VOP main interface:

**FIGURE 6-1** MD-VOP Main Interface



1. Dashboard
2. Library Panel

As shown in [FIGURE 6-1](#), The MD-VOP interface is divided into two sections:

- The [Dashboard](#) displays the general state of all tape drives in your configuration.
- The [Library Panel](#) displays information for tape drives in a selected library.

Both sections include menus you can use to perform various functions on selected tape drives.

# Dashboard

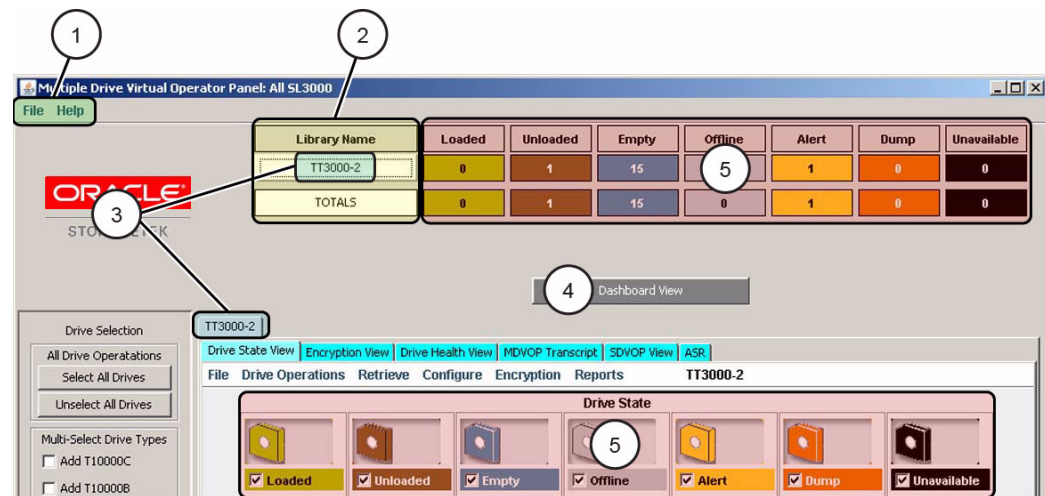
The Dashboard displays the general state of all tape drives in your configuration. It displays the number of tape drives in each drive state, for both a selected library and the entire MD-VOP configuration.

**Note** – A tape drive can be in multiple states at a given time.

The dashboard includes menus you can use to create, launch, and save configurations, and perform other configuration tasks.

The following figure shows the MD-VOP dashboard:

**FIGURE 6-2** MD-VOP Dashboard



1. Menus
2. Title
3. Library Name
4. View button
5. Drive State Counts

As shown in [FIGURE 6-2](#), the Dashboard includes the following:

## Menus

Use menus to create, update, or launch an MD-VOP configuration. See [“Using MD-VOP Dashboard Menus” on page 57](#) for more information.

## Title

The configuration name as defined on the MD-VOP Configuration screen.

## Library Name

The library name that was created when the configuration was built. When you click on a library name in the dashboard, the corresponding library tab is actively displayed in the library panel.

### **View Button**

Click this button to toggle between the Dashboard view and Full view. In the Dashboard view, the Library Panel is hidden.

### **Drive State Counts**

Displays the number of tape drives in each of the following drive states:

- Loaded
- Unloaded
- Empty
- Offline
- Alert
- Dump
- Unavailable

Separate counts are displayed for the selected library, and for all tape drives in the MD-VOP configuration.

**Note –** A tape drive may be in multiple states at a given time.

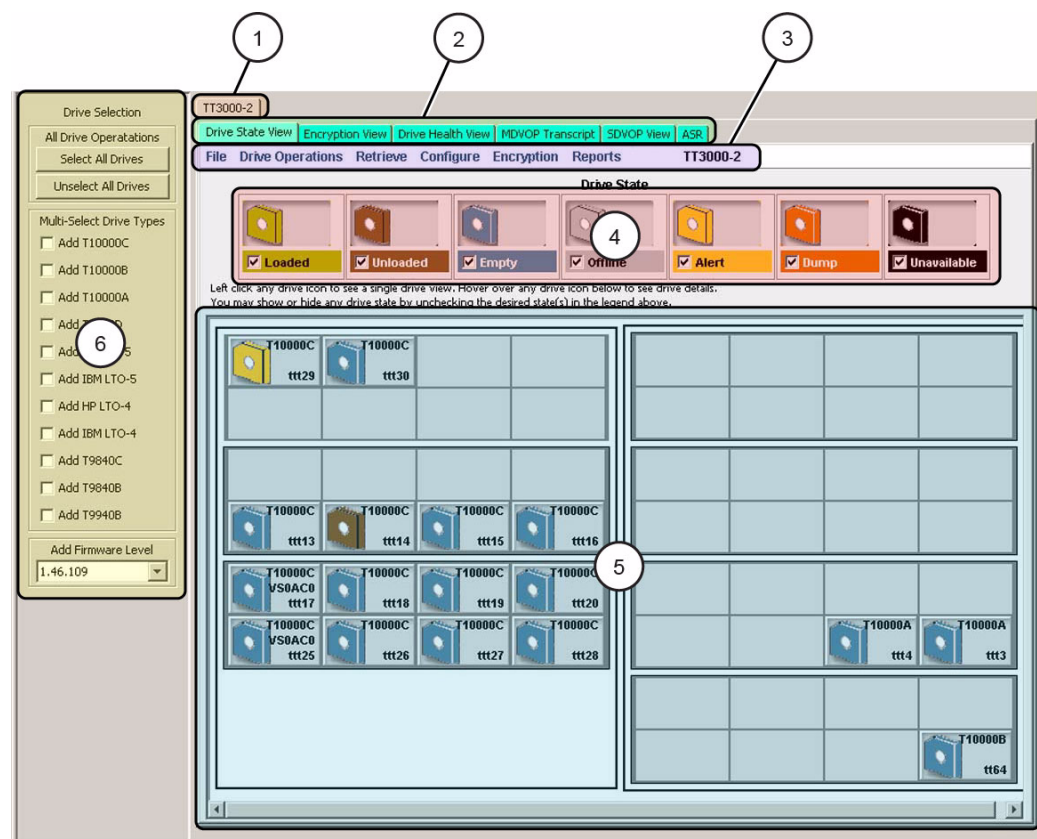
See [“Drive States” on page 45](#) for a description of these drive states.

# Library Panel

The Library Panel displays information for tape drives in a selected library. It includes menus you can use to control, update, and view selected tape drives within the library.

The following figure shows the MD-VOP Library Panel:

**FIGURE 6-3** MD-VOP Library Panel



1. Library Tabs
2. Drive View Tabs
3. Menus
4. Legend
5. Drive Details
6. Drive Selection Panel

As shown in [FIGURE 6-3 on page 39](#), the Library Panel includes the following:

### Library Tabs

These tabs display library names. A separate tab is created for each library in your configuration.

When you click a library tab, it becomes active, and the Library Panel displays tape drive information specific to that library.

### Drive View Tabs

These tabs display different types of tape drive information for the tape drives in the selected library.

When you click a tab, it becomes active, and the legend and Drive Details section display accordingly. See [“Drive States” on page 45](#) for information about each drive state.

### Menus

Use menu commands to manipulate or obtain data for one or more selected tape drives. See [“Using the MD-VOP Interface” on page 35](#) for more information.

**Note** – If the SDVOP View tab is selected, these menus change to provide commands specific to the selected tape drive.

### Legend

The legend provides a visual key for the information displayed in the Drive Details section of the Library Panel. The legend is based on the Drive View tab that is active.

### Drive Details

The Drive Details section displays an icon for each tape drive in the selected library. These icons are color coded according to the legend.

You can perform the following functions:

- **Click** on an individual tape drive icon to display the Single Drive Virtual Operator Panel (SDVOP) View for that tape drive. See [“SDVOP View” on page 51](#) for information.
- **Ctrl-click** on a tape drive icon to select or unselect the tape drive. Once you select a tape drive, you can issue Library Panel menu commands for that drive.
- **Right-click** on a tape drive icon to display functions that can be performed on that tape drive.

These are the same functions provided in the Library Panel’s Drive Operations menu. See [“Drive Operations Menu” on page 83](#) for a description of these functions.

- **Mouse-over** a tape drive icon to display the following information for that drive:

**Drive state**

ONLINE or OFFLINE.

**Cartridge**

LOADED or EJECTED.

**Dump**

AVAILABLE or NOT AVAILABLE.

**Drive Name**

The tape drive name as defined in the MD-VOP Configuration screen.

**Volser**

The volume serial number of a tape, if present and detected in the tape drive.

**Serial Number**

The internal serial number of the tape drive.

**Firmware Level**

The firmware currently loaded on the tape drive.

**Port A WWN**

The World Wide Name for port A.

**Port B WWN**

The World Wide Name for port B.

**IP Address**

The IP address defined for the tape drive.

**Host Name**

The host name, if detected from DNS.

**Library Slot Location**

The physical slot location in the library.

**Library Internal Location**

The physical location in the library as defined internally to the library (SL8500 and SL3000 only).

**ACSL/HLI Address**

The location that would appear in the ACS (SL8500 and SL3000 only).

**Tray SN**

The serial number entered on the MD-VOP Configuration screen, used for support.

**Licensed**

true or false, to indicate whether the tape drive is licensed for encryption.

**Encryption Type**

The type of encryption used on this tape drive.

**Encryption State**

Enrolled or Unenrolled, to indicate whether the tape drive can obtain keys from OKM.

**Agent ID**

The OKM agent id.

**KMS IP**

The OKM IP address.

**Drive Selection Panel**

Use the Drive Selection Panel to select multiple tape drives based on different criteria.

**Note –** This panel applies only to the library that is currently selected.

You can perform the following functions:

- Click the **Select All Drives** button to select all tape drives in the library.
- Click the **Unselect All Drives** button to unselect all tape drives in the library.
- Click the **Multi-Select Drive Types** check boxes to select specific drive types.
- Click the **Add Firmware Level** drop-down menu to select a specific level of tape drive firmware.

**Note –** This can help you identify tape drives that are not at the appropriate firmware level.

## MD-VOP Drive Views

The MD-VOP Library Panel includes the following drive view tabs, used to display different types of information for tape drives in a selected library:

- [Drive State View](#)
- [Encryption View](#)
- [Drive Health View](#)
- [MD-VOP Transcript](#)
- [SDVOP View](#)
- [ASR](#)

**Note –** By default, the Encryption view is not displayed, unless you indicated to include it when you installed MD-VOP. You can activate this view using the MD-VOP Default Settings screen. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

## Drive State View

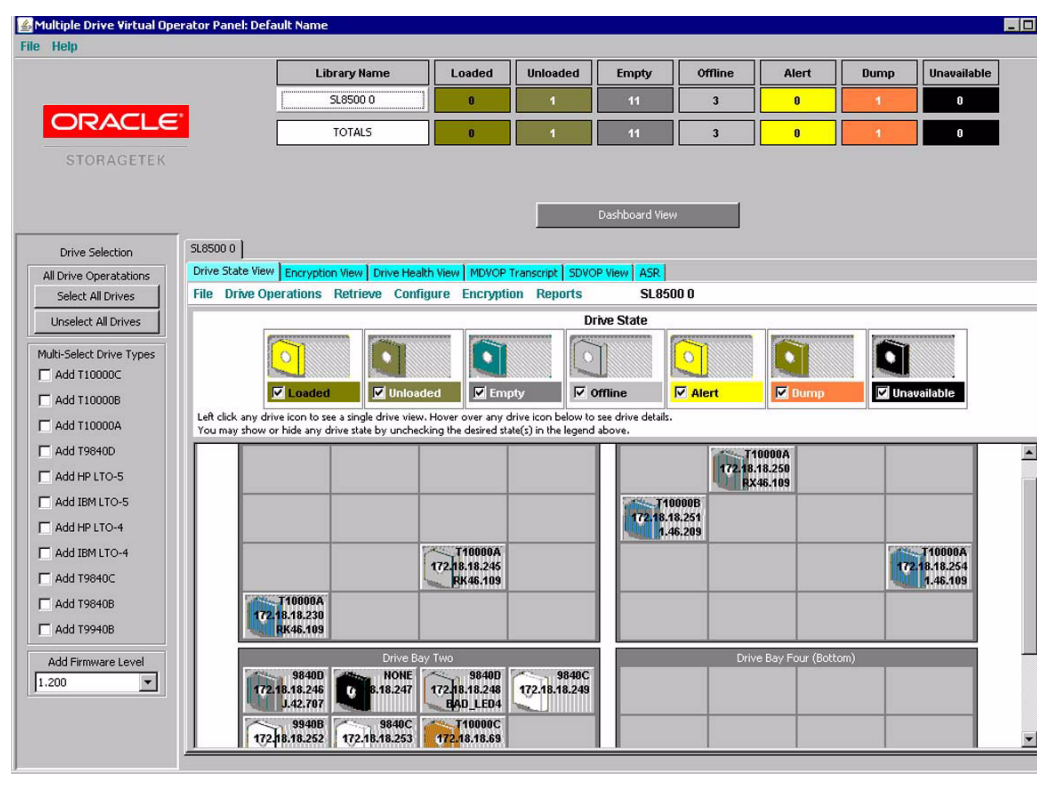
From the MD-VOP Library Panel, select the Drive State View tab to display the current state of the tape drives in the selected library.

**Note** – You may encounter a minimal delay when this view is selected.

This view is only supported for the T9840D, T10000 series, and LTO 4/5 tape drives. All other drives will display a white icon as an indicator of connection, for which other logs can be obtained.

The following figure shows an example of the Drive State view:

**FIGURE 6-4** Drive State View Example



## Drive State View Legend

The following figure shows the legend displayed in the Drive State View:

**FIGURE 6-5** Drive State Legend



You can use the legend to filter the tape drives that are displayed in the Library Panel. Click the check box for a particular drive state to include or exclude applicable drives in the Library Panel.

### Drive States

By default, the legend includes the following drive states:

**Note** – You can customize icon labels and colors. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

#### Loaded

A tape cartridge is loaded and is ready to be used by the tape drive. This status is green by default.

#### Unloaded

A tape cartridge is unloaded. The tape cartridge resides in the tape drive, but is not actually threaded through the tape drive. This status is brown by default.

#### Empty

There is no tape cartridge in the tape drive. This status is blue by default.

#### Offline

The tape drive is not communicating with the system. This state is used for maintenance to the tape drive. In this state, commands from the host (backup server) are not processed. This status is grey by default.

#### Alert

The tape drive is in need of cleaning due to periodic or error detection limits. This status is yellow by default.

#### Dump

A dump can occur for a problem that falls outside of the limits in the firmware on the tape drive. This is an SNO (should not occur) in a memory dump from the tape drive. Send the dump to Support for analysis. This status is orange by default.

#### Unavailable

A tape drive is not communicating with MD-VOP. This status is black by default.

## Encryption View

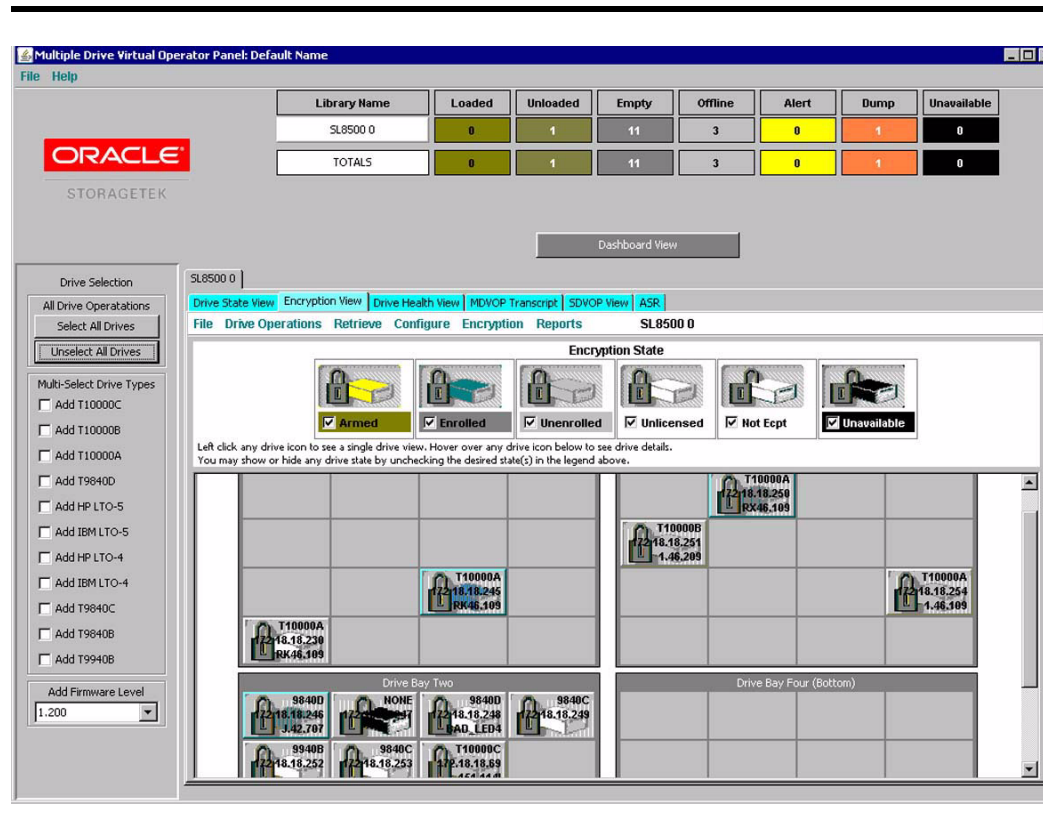
From the MD-VOP Library Panel, click the Encryption View tab to display the current encryption state of the tape drives in the selected library. You may encounter a minimal delay when this view is selected.

**Note** – By default, the Encryption view is not displayed, unless you indicated to include it when you installed MD-VOP. You can activate this view using the MD-VOP Default Settings screen. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

Only T9840D, T10000 series, and encrypting LTO tape drives support encryption through an Oracle Key Manager (OKM) system.

The following figure shows an example of the Encryption view:

**FIGURE 6-6** Encryption View Example



## Encryption View Legend

The following figure shows the legend displayed in the Encryption View:

**FIGURE 6-7** Encryption Legend



You can use the legend to filter the tape drives that are displayed in the Library Panel. Click the check box for a particular drive state to include or exclude applicable tape drives in the Library Panel.

### Encryption States

By default, the legend includes the following encryption states:

**Note** – You can customize icon labels and colors. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

#### Armed

The tape drive has acquired an encryption key from OKM. The tape drive can write encrypted data. This status is green by default.

#### Enrolled

The tape drive is enrolled with OKM but does not have an encryption key from OKM. This status is blue by default.

#### Unenrolled

The tape drive has been reset and is no longer enrolled with OKM. The tape drive cannot write encrypted data. This status is gray by default.

#### Unlicensed

The tape drive is capable of encryption, but the license key for the tape drive has not been sent to the tape drive. This status is white by default.

#### Not ecpt

The tape drive is not capable of encryption. This status is white by default.

#### Unavailable

The tape drive is not communicating with MD-VOP. This status is black by default.

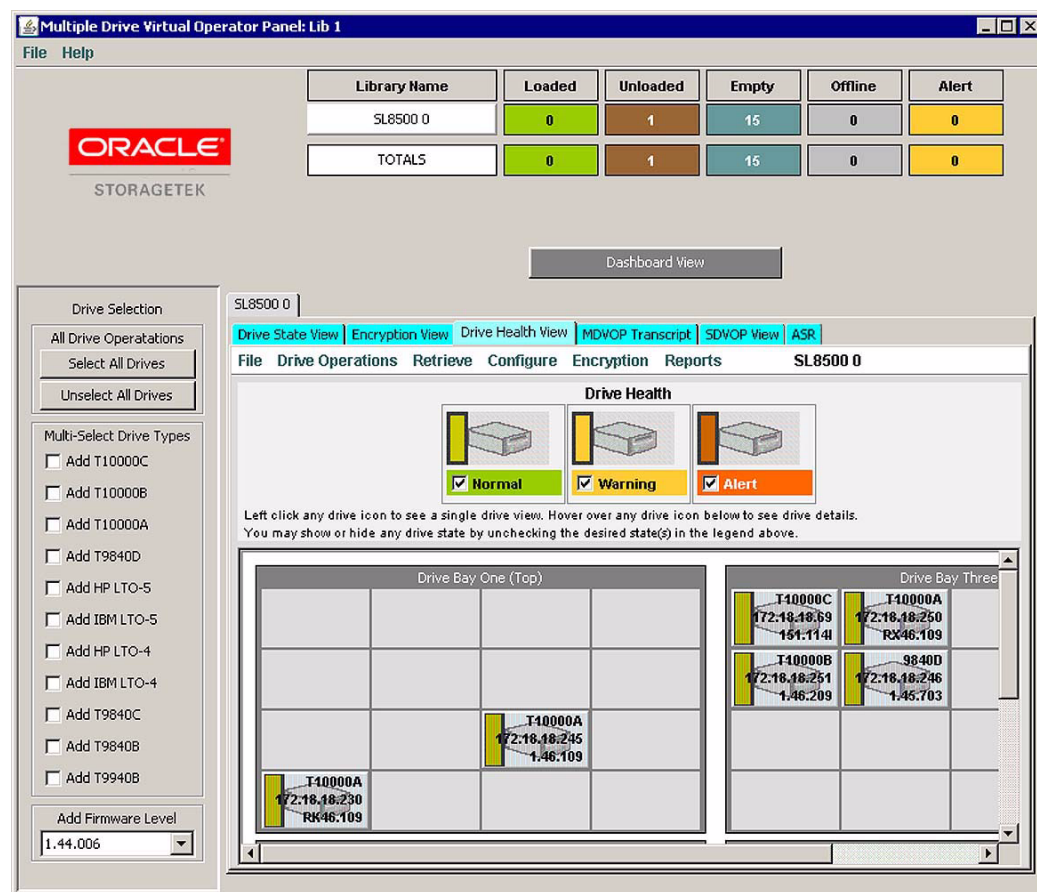
## Drive Health View

From the MD-VOP Library Panel, click the **Drive Health View** tab to display the current health status of the tape drives within the selected library. You may encounter a minimal delay when this view is selected.

**Note** – At MD-VOP startup, the “good” state color is indicated by default. This remains until you issue a Perform Health Check command from the Library Panel Drive Operations menu. See [“Drive Operations Menu” on page 83](#) for more information.

The following figure shows an example of the Drive Health view:

**FIGURE 6-8** Drive Health View Example



## Drive Health View Legend

The following figure shows the legend displayed in the Drive Health view:

**FIGURE 6-9** Drive Health View Legend



You can use the legend to filter the tape drives that are displayed in the Library Panel. Click on the check box for a particular drive state to include or exclude applicable tape drives in the Library Panel.

### Drive Health States

By default, the legend includes the following drive health states:

**Note –** You can customize icon labels and colors. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

#### Normal

No events are found on the tape drive. This status is green by default.

#### Warning

The tape drive has a concern that requires review. This status is yellow by default.

#### Alert

The tape drive requires attention. This status is also triggered when the tape drive is unavailable for connection. This status is red by default.

## MD-VOP Transcript

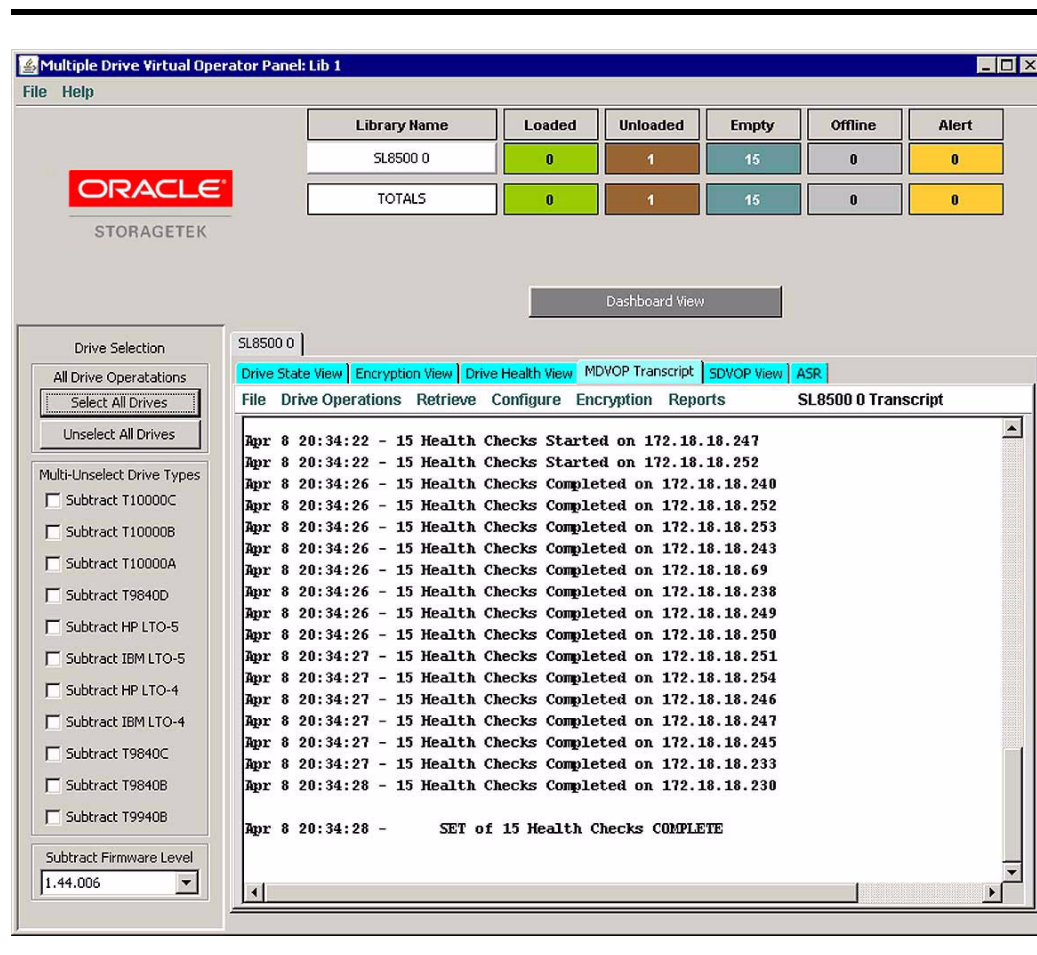
From the MD-VOP Library Panel, click the **MD-VOP Transcript** tab to display all global commands sent or received from the tape drives in the selected library.

**Note** – You may encounter a minimal delay when this view is selected.

MD-VOP transcripts are stored in the transcripts subdirectory within the MD-VOP application folder.

The following figure shows an example of the MD-VOP Transcript view:

**FIGURE 6-10** MD-VOP Transcript View Example



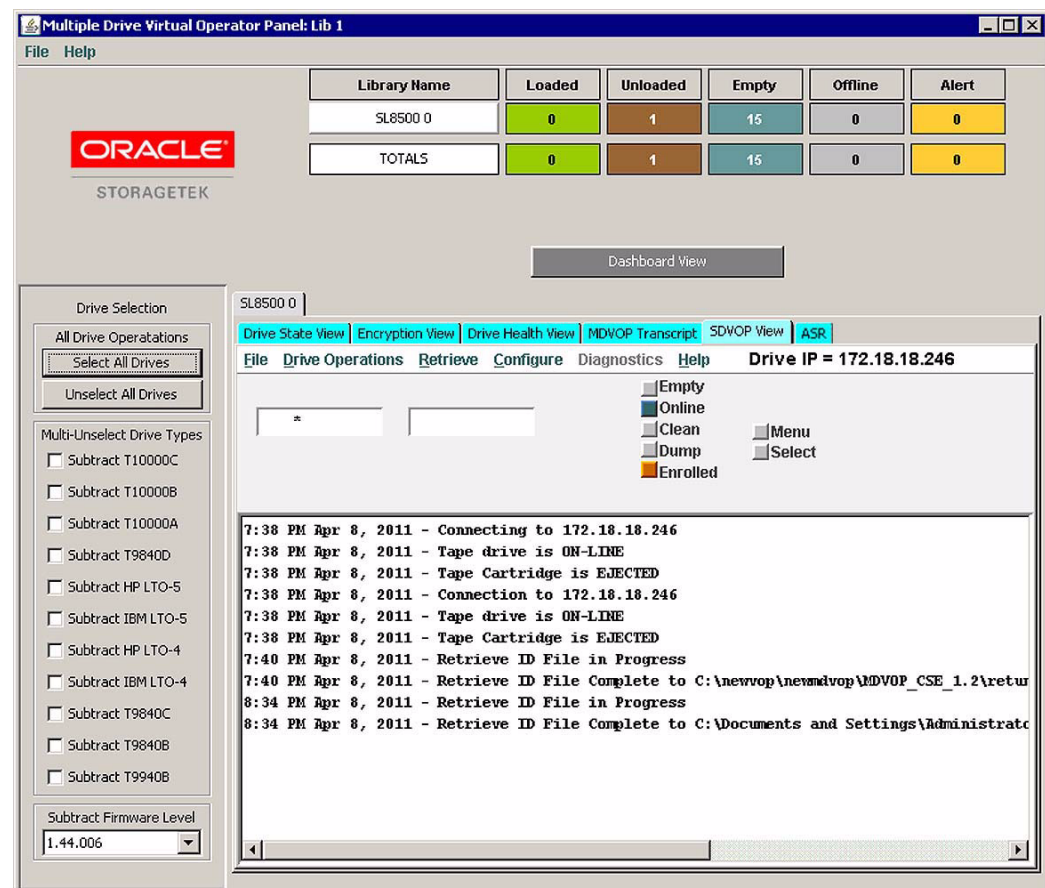
## SDVOP View

Click on a tape drive icon in the Library Panel to access the SDVOP (single-drive) View for that tape drive. The **SDVOP View** tab becomes active.

- If you click on a T9840D or T10000 tape drive, the T10000 9840D SDVOP interface is displayed in the MD-VOP Library Panel. See [“Using T10000 9840D VOP” on page 93](#) for information about using T10000 9840 VOP.
- If you click on an LTO tape drive, the LTO VOP interface is displayed in the MD-VOP Library Panel. See [“Using LTO VOP” on page 113](#) for information about using LTO VOP.
- If you click on a T9840B, T9840C, T9940A, or T9940B tape drive, the 9XXX VOP interface is displayed in the MD-VOP Library Panel. See [“Using 9XXX VOP” on page 127](#) for information about using 9XXX VOP.

The following figure shows an example of the SDVOP view for a T10000 tape drive:

**FIGURE 6-11** SDVOP View Example



As shown in [FIGURE 6-11](#), the SDVOP View is active, and the T10000 9840D VOP interface is displayed in the MD-VOP Library Panel.

## ASR

From the MD-VOP Library Panel, click the **ASR** tab to display the ASR view.

**Note** – You may encounter a minimal delay when this view is selected.

Auto Service Request (ASR) is a feature of Oracle Premier Support for Systems and Oracle Limited Warranty that is designed to automatically request Oracle service when specific hardware faults occur.

ASR is designed to resolve problems more quickly by eliminating the need to initiate contact with Oracle services for hardware failures, reducing both the number of phone calls needed and overall phone time required. ASR also simplifies support operations by utilizing electronic diagnostic data. ASR is easy to install and deploy is completely controlled by you to ensure security.

For more information about ASR, refer to the ASR publications available at the following URL:

<http://www.oracle.com/asr>

The following figure shows an example of the MD-VOP ASR view:

**FIGURE 6-12** ASR View Example

The screenshot displays the MD-VOP ASR View interface. At the top, there's a title bar 'Multiple Drive Virtual Operator Panel CSE Level Access: Default Name'. Below it, a sidebar on the left contains 'Drive Selection' options like 'All Drive Operations', 'Select All Drives', and 'Unselect All Drives'. The main area features a table with drive status and a section for managing ASR devices.

Library Name	Loaded	Unloaded	Empty	Offline	Alert	Dump	Unavailable
SL8500 0	0	0	6	2	0	1	0
SL8500 1	0	0	2	0	0	0	1
SL8500 2	0	0	2	0	0	0	1
TOTALS	0	0	10	2	0	1	0

The main area shows the 'ASR' tab selected. It includes a 'Drive Selection' sidebar with checkboxes for various drive types (e.g., T10000C, T10000B, T10000A, T9840D, HP LTO-6, HP LTO-5, IBM LTO-5, HP LTO-4, IBM LTO-4, T9840C, T9840B, T9940B). The main content area has a 'Please select elements to activate or deactivate devices for sending ASR, the right pane contains activated devices, the left pane contains deactivated devices.' instruction. Below this, there are two panes: 'Available Devices' and 'Selected/Activated Devices'. The 'Available Devices' pane lists several drives with their IDs. The 'Selected/Activated Devices' pane is currently empty. At the bottom, there's a note: 'Just drag and drop from left pane to right pane to activate and from the right pane to left pane to deactivate. Devices with an \* at the end, are the already Activated Devices.' and a warning: 'If you do not see any available devices, please check "Tray S/N" in MDVOP configuration'.

As shown in [FIGURE 6-12 on page 52](#), the ASR view includes the following tabs:

- [ASR Register](#)
- [ASR Activate](#)
- [ASR Creation](#)
- [ASR Log](#)
- [ASR Test](#)

By default, the ASR Activate page is selected when you click the ASR tab.

Before you can create a service request, you must first register with MOS (using the ASR Register tab) and activate your devices (using ASR Activate tab).

## ASR Register

To use the ASR feature, you must first register with My Oracle Support (MOS) and optionally, the ASR Manager.

If you are connecting to ASR Manager, you must perform registration in ASR Manager before using the ASR Register page in MD-VOP.

The ASR backend infrastructure at Oracle collects all telemetry data forwarded to it from the ASR Manager. The fault-rule technology on these backend systems ascertains the reality of the fault telemetry, and forwards recognized faults to Oracle's Service Request system. From there, the following actions occur:

- A Service Request, also called a case, is created and assigned to an Oracle Support Engineer. At the same time, an e-mail notification of the Service Request is sent to your support contact on record associated with the system reporting a fault.
- The Service Request is handled in accordance with the asset's Support or Warranty contract.

To register:

1. **In the Enter valid Oracle MOS account field, enter your My Oracle Support (MOS) username and password.**
2. **Enter ASR Manager internet settings. The ASR Manager is a system that centrally accepts hardware telemetry data sent from a group of ASR Assets. The ASR Manager filters the incoming data and forwards potential fault telemetry to Oracle ASR backend systems.**
  - If you are accessing the ASR Manager directly, click the **ASR Manager** check box and then enter the ASR Manager Hostname and Port for the server where ASR Manager resides.
  - If you are accessing the internet through a proxy, click the **Enable Proxy Configuration** check box and provide the following:
    - Proxy server host name
    - Proxy port number
    - Proxy user name
    - Proxy password

- NTLM Domain Name (if applicable)
- NTLM Host Name (if applicable)

**Note** – If you access the internet through a proxy, check with your network administrator to collect information needed to configure the ASR Manager system.

3. Click the **Submit** button to register with the supplied information, or click the **Clear** button to cancel the operation.

## ASR Activate

Click this tab to display the ASR Activate page. Use this page to activate one or more tape drives. In order to create an ASR for a particular tape drive, you must first activate the tape drive.

To activate a tape drive, select it from the Available Devices window and drag and drop it in the Selected/Activated Devices window.

Devices are listed with the following information:

- drive type
- internal serial number
- tray serial number
- entitled status

**Note** – An asterisk indicates a device that has already been activated.

After you activate one or more tape drives, the Account Manager must enable these ASR Assets in My Oracle Support. Otherwise, any alerts you attempt to send will be dropped. Refer to the *Oracle Auto Service Request Installation and Operations Guide* for instructions. A valid service contract is required.

## ASR Creation

Click this tab to display the ASR Creation page. Use this page to create a MOS Service Request, or Case, for one or more tape drives.

**Note –** Before you can create a service request, you must first register with MOS (using the ASR Register tab) and activate your devices (using the ASR Activate tab).

To create a Service Request:

1. **Click the drop-down menu and select an activated tape drive for which to create a MOS Service Request.**
2. **Select additional devices for the Service Request. Drag and drop devices from the Available Devices window to the Selected drives window.**
3. **Enter any additional information to be included in the Service Request.**
4. **Click the Create ASR button to create the Service Request in MOS, or click the Clear button to cancel the operation.**

Once the Service Request is created in MOS, logs are automatically collected, transmitted to the Oracle ASR backend system, and attached to the Service Request.

## ASR Log

Click this tab to view a running log of ASR activity.

**Note –** Logs are not produced for LTO drives.

## ASR Test

Click this tab to test end-to-end communications between a tape drive and the Oracle ASR backend system.

**Note –** Before you can test communications, you must first register with MOS (ASR Register tab) and activate your devices (ASR Activate tab).

To test communications:

1. **Click the drop-down menu and select an activated tape drive.**
2. **Click the Test button.**

When the test completes, the user registered under MOS receives a confirmation e-mail indicating whether the test was successful. If the test fails, the e-mail includes possible causes.



---

## Using MD-VOP Dashboard Menus

Use MD-VOP Dashboard menu commands to create or edit an MD-VOP configuration, and to specify application settings. A configuration applies to the libraries and tape drives that are to be displayed in the Drive Details section of the Library Panel.

The Dashboard includes a [File Menu](#) and [Help Menu](#).

### File Menu

The File menu includes the following commands:

#### **Launch Configuration**

Displays a pop-up window you can use to open a previously saved configuration.

#### **Edit Configuration**

Displays the Configuration screen, used to create a new configuration or edit and existing configuration. See [“Using the MD-VOP Configuration Screen”](#) on page 60 for more information.

#### **Set as Default Configuration File**

Sets the current configuration as the default. This configuration is automatically loaded the next time you start MD-VOP.

### Edit Library Probe Configuration

Displays the Library Probe Configuration dialog box, used to set defaults for establishing communication with a tape library. These defaults are applied on the Configuration screen when you enter the IP address for an SL500, SL3000, or SL8500 library.

Enter the following default library probe settings:

- **Default User**

The account used to connect to a library. Enter an account or select one of the following from the drop-down menu:

- admin - The general administration account provided to you.
- remote - Remote user for libraries.
- acsss - Placeholder for future ACSLS functionality.
- oem - An OEM account from a partner. Also used for libraries.

- **Default Password**

The password for the default account. Once you connect to a library, you can change the password to be specific to that library.

- **Unknown Host Authorization**

Applies when using SSH for communication. Library credentials can be displayed for you to accept or decline.

Select one of the following from the drop-down menu:

- Auto - SSH credentials are not displayed, and are automatically accepted.
- Prompt - SSH credentials are displayed and you are prompted to accept or decline.

- **Connection Timeout**

The timeout value, in seconds, for the connection within SSH while establishing a connection to the library.

- **Process Execution Timeout**

The timeout value, in seconds, for an individual command being sent.

### MDVOP Default Settings

Displays the Default Settings screen, used to edit MD-VOP display settings. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

### Get MDVOP Logs for Support

Collects all MD-VOP logs and saves them in a zip file at the specified location.

### Launch

Launches an existing configuration. The five most recent configurations are listed.

### Launch Single Drive T10000/9840D VOP

Launches the T10000/9840D VOP in a new window.

**Launch Single Drive LTO VOP**

Launches the LTO VOP in a new window.

**Launch Single Drive 9XXX VOP**

Launches the 9XXX VOP in a new window.

**Exit**

Exits the MD-VOP application.

**Note –** You can also click the “X” icon in the upper right corner of the window to exit the MD-VOP application.

## Help Menu

The Help menu includes the following commands:

**Contact Support**

Displays a warranty statement and information about contacting Oracle to obtain MD-VOP support.

**About**

Displays the following information about the MD-VOP application and environment:

- Role level access
- MD-VOP Version
- MD-VOP Build Date
- VOP Version
- VOP Build Date
- Java Version
- License Agreement

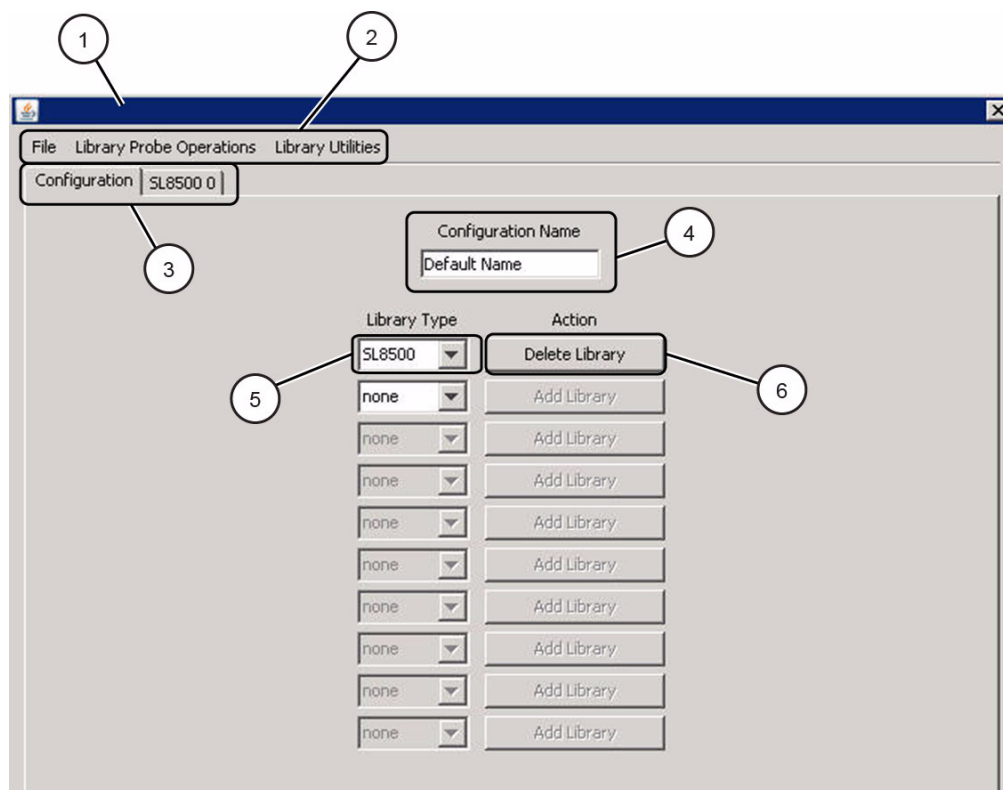
## Using the MD-VOP Configuration Screen

From the Dashboard, click on the **File** menu and select **Edit Configuration** to access the Configuration screen.

Use this screen to create a new MD-VOP configuration, or edit an existing MD-VOP configuration. You can also use this screen to find a tape drive, probe a range of IP addresses, or change the IP address of a tape drive.

The following figure shows the Configuration screen:

**FIGURE 7-1** MD-VOP Configuration Screen



1. Title
2. Menus
3. Tabs
4. Configuration Name
5. Library Type drop-down menu
6. Add Library/Delete Library button

As shown in [FIGURE 7-1 on page 60](#), the Configuration screen includes the following:

**Title**

The file name used to create this configuration.

**Menus**

Use menus to issue MD-VOP configuration commands. See [“Configuration Menus” on page 66](#) for more information.

**Tabs**

A Configuration tab is displayed, along with additional tabs for each library you add. Click on a library tab to display its Library Spreadsheet page, where you can define detailed settings for the library. See [“Library Spreadsheet Page” on page 62](#) for more information.

**Configuration Name**

The configuration name as displayed on the MD-VOP dashboard.

When you create a new MD-VOP configuration, Default Name is displayed. Overwrite this value with your new configuration name.

**Library Type drop-down menu**

Click this drop-down menu to select a library type to be added or deleted. This selection defines the possible types of slots available.

**Action**

Click this button to add or remove a library from the MD-VOP configuration.

- When you add a library, a new tab is created, and the Library Spreadsheet page for the new library is displayed. Use this page to define your library settings. See [“Library Spreadsheet Page” on page 62](#) for more information.
- When you delete a library, **all entries** for that library are removed.

## Library Spreadsheet Page

To display the Library Spreadsheet page for a particular library, click on the appropriate library tab from the MD-VOP Configuration screen. Use the Library Spreadsheet page to define or view detailed library settings.

The following figure shows an example of the Library Spreadsheet page.

**FIGURE 7-2** Library Spreadsheet Page

The screenshot displays the 'Library Spreadsheet Page' with three main sections:

- 1. Library Settings:** Includes fields for 'Lib Name' (SL8500 0), 'IP Address', and 'Lib SN', along with a 'Probe Library' button.
- 2. Tape Drive Settings:** Includes 'Auto-fill Drive Name' (radio buttons for OFF and ON), 'IP Address Preamble' (text field), and 'Auto-probe for Drives' (radio buttons for ON and OFF).
- 3. Drive Definition Spreadsheet:** A table with 27 rows and 6 columns: Slot #, IP Address, Drive Name, Drive Type, DMOD S/N, and Tray S/N.

Slot #	IP Address	Drive Name	Drive Type	DMOD S/N	Tray S/N
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					

1. Library Settings
2. Tape Drive Settings
3. Drive Definition Spreadsheet

As shown in [FIGURE 7-2 on page 62](#), the Library Spreadsheet page is divided into three sections:

- [Library Settings](#)
- [Tape Drive Settings](#)
- [Drive Definition Spreadsheet](#)

## Library Settings

The Library Spreadsheet page includes the following library settings:

### Lib Name

Specify the library name. This is used as the user-defined library name.

### Number of Drive Bays (SL3000 only)

Specify the number of optional tape drive modules.

### IP Address

Specify the IP address for the library.

### Lib SN

Specify the serial number for the library.

Click the **Probe** button to perform a probe based on the specified settings. Once the probe completes, the Library Spreadsheet is automatically populated with the results of the probe.

## Tape Drive Settings

The Library Spreadsheet page includes the following tape drive settings:

### IP Address Preamble

Optionally, enter the first three fields of the tape drive IP address. This will be used as the preamble for the IP specification in the second column of the Drive Definition spreadsheet. This preamble will be appended to that specification to form the complete IP address.

### Auto-fill Drive Name

Use these options to automatically populate the Drive Name column of the Drive Definition spreadsheet:

#### Off

Do not attempt to automatically populate the Drive Name column.

#### IP Address

Use the IP address as the default name in the Drive Name column.

#### Slot Number

Use the slot location as the default name in the Drive Name column.

### DNS Node Name

Use the DNS entry for the IP address (if detected) as the default name in the Drive Name column.

### Auto-probe for drives

Direct MD-VOP to probe for drive type and serial number when you enter an IP address on the Drive Definition spreadsheet. Click **ON** to enable this feature. Click **OFF** to disable this feature.

## Drive Definition Spreadsheet

The Drive Definition spreadsheet includes six columns:

#### 1. Slot number

The library slot in which the tape drive is located.

#### 2. IP Address

The IP address of the tape drive.

#### 3. Drive Name

Human readable name of the tape drive.

**Note** – This field can be user entered.

#### 4. Drive Type (special)

The model of the tape drive in this slot. The value of this field determines which connection protocol and single-drive VOP style to use when connecting to this tape drive:

- **Tenet**

T10000 family, T9840D. Detected by probe operation.

- **LTO**

Ethernet-enabled encryption HP and IBM LTO4/5. Detected by probe operation.

- **FTP**

T9840B/C, T9940B. Detected by probe operation.

- **Placeholder**

Indicates that a non-Ethernet connected tape drive is in this library location. For example, LTO2, LTO3, etc. This field must be manually entered.

#### 5. DMOD S/N

The serial number for the tape drive in this library slot.

#### 6. Tray S/N

The serial number of the tray for the tape drive in this library slot.

### ***Populating the Drive Definition Spreadsheet***

The drive definition spreadsheet must include a populated row for each tape drive in the library.

To populate the spreadsheet, do one of the following:

- Specify library settings and click the **Probe** button.
- If you enable the Auto-probe for drives option, you can enter an IP address in the spreadsheet and allow MD-VOP to probe for the drive. Once the drive is detected, the remaining columns are automatically populated.
- Use configuration menu commands to select a range and probe for multiple IP addresses. Once IP addresses are detected, the spreadsheet columns are automatically populated.

See [“Using Probe Commands” on page 69](#) for more information.

When you are finished entering tape drives on the spreadsheet, click the next empty row in the spreadsheet to signal to MD-VOP that the last row is complete. Then click the File menu and select **Save** to save your configuration.

## Configuration Menus

The following configuration menus are displayed at the top of the Configuration screen:

- [File Menu](#)
- [Library Probe Operations Menu](#)
- [Library Utilities Menu](#)

### File Menu

The File menu includes the following commands:

#### **Open Configuration**

Opens an existing configuration.

#### **New Configuration**

Creates a new, “empty” configuration with no libraries or tape drives. The current configuration is not affected.

#### **Save**

Saves the configuration.

#### **Save as**

Saves the configuration with a specified name.

#### **Delete Configuration File**

Deletes the configuration.

#### **Set as Default Configuration**

Sets the current configuration as the default configuration that is loaded when you start MD-VOP.

#### **Unset Default Configuration**

Clears the default configuration setting.

#### **Launch**

Launches an existing configuration. The five most recent configurations are listed.

#### **Exit Configuration Dialog**

Exits the Configuration screen.

## Library Probe Operations Menu

Use the Library Probe Operations menu to populate tape drive information in the active library spreadsheet page.

This menu includes the following commands:

### Probe IP Addresses in Spreadsheet

If an IP address is present in column 1, probe for a valid device.

**Note** – The auto probe routine (enabled by default) performs the same function. For valid IP addresses, the Drive Type and Drive Serial Numbers will be automatically populated. See [“Auto-probe for drives” on page 64](#) for more information.

### Probe IP Range for Drives

Probes tape drives for a single library, based on an IP range. See [“Probing an IP Range for Drives” on page 70](#).

### Probe Library for Drives

Probes a library based on the specified library IP address and automatically populates the drive information in the Library Spreadsheet.

### Probe Complex (SL8500 Only)

Use the Library Probe Operations menu to direct MD-VOP to probe for a collection of SL8500 libraries connected with pass-through ports.

MD-VOP creates the libraries that can be detected from information reported by tape drives, and inserts the tape drives in the appropriate library.

This option is only valid for T10000 tape drives. These tape drives must be at appropriate firmware levels. See [“MD-VOP Tape Drive Support” on page 17](#) for more information.

**Note** – This option is recommended only for new, “empty” configurations. Using this option with an existing configuration can result in mismatches and duplicate information.

See [“Probing a Complex” on page 69](#) for information about performing the probe.

## Library Utilities Menu

This menu includes the following commands:

### Clear Spreadsheet

Clears all entries in the current drive definition spreadsheet. All entries are stored until you save the configuration.

### Reset Probe Settings for this Library

Clears all entries in the current drive definition spreadsheet. All entries are stored until you save the configuration.

### Retrieve Library SN

Clears all entries in the current drive definition spreadsheet. All entries are stored until you save the configuration.

### Scan Tray Serial Numbers

Allows you to enter a serial number for a selected slot. This serial number is used when requesting support. It is included in reports, and in the information displayed when you mouse-over a tape drive.

This command loops through each tape drive present and requests that the tray serial number be added to the drive definition spreadsheet. For each slot, enter the serial number and press the OK button.

**Note –** You can also manually add these serial numbers to the drive definition spreadsheet.

## Using Probe Commands

MD-VOP includes Probe commands designed to help you build an MD-VOP configuration. These commands probe for libraries and tape drives, and then create and populate the corresponding library spreadsheet pages.

Access these commands from the Library Probe Operations menu on the MD-VOP Configuration screen.

### Probing a Complex

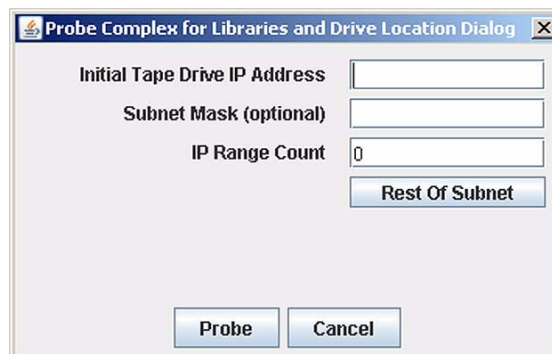
Use the Library Probe Operations menu to direct MD-VOP to probe for a collection of SL8500 libraries connected with pass-through ports. MD-VOP creates the libraries that can be detected from information reported by tape drives, and inserts the tape drives in the appropriate library.

This option is only valid for T10000 tape drives. These tape drives must be at appropriate firmware levels.

Additionally, this option is recommended only for new, “empty” configurations. Using this option with an existing configuration can result in mismatches and duplicate information.

To probe an SL8500 library complex:

1. Click on the **Library Probe Operations** menu and select **Probe Complex (SL8500 Only)**. A pop-up window appears:



2. Enter the Initial Tape Drive IP Address. Optionally, you may include the number of bits in the subnet mask. For example, 172.18.18.1/23.
3. Optionally, enter the number of bits in the subnet mask. This is an alternative to the method described in the previous step.
4. Enter the IP range count to scan from the base address. Click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.
5. Click the **Probe** button.

A status window appears as MD-VOP begins to probe each IP address in the specified range to locate any tape drives. During this process, MD-VOP scans the IP range, creates libraries, and places detected tape drives into the correct library and slot location.

If you wish to cancel this operation, click the **Abort Probe** button at any time.

6. When the probe completes, an informational window appears, indicating the number of tape drives that were located and placed and the number of tape drives that were unable to be placed.

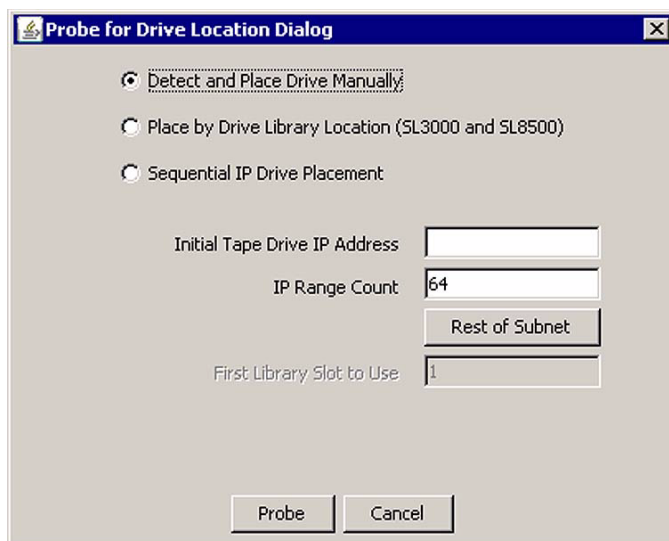
**Note** – You can manually enter the unsuccessful tape drives.

7. Click OK. MD-VOP creates a new tab in the Library Panel for each library detected. In addition, the drive definition spreadsheet for each library is automatically populated with the valid tape drive information.

## Probing an IP Range for Drives

Use the Library Probe Operations menu to direct MD-VOP to probe for tape drive IP addresses within a selected library.

Click on **Library Probe Operations** and select **Probe IP Range for Drives**. The following pop-up window appears:



The image shows a dialog box titled "Probe for Drive Location Dialog". It contains three radio buttons for selecting a probing method: "Detect and Place Drive Manually" (which is selected), "Place by Drive Library Location (SL3000 and SL8500)", and "Sequential IP Drive Placement". Below the radio buttons are four input fields: "Initial Tape Drive IP Address" (empty), "IP Range Count" (containing "64"), "First Library Slot to Use" (containing "1"), and a button labeled "Rest of Subnet". At the bottom of the dialog are two buttons: "Probe" and "Cancel".

This window includes radio buttons used to select one of the following probing methods:

- **Detect and Place Drive Manually**

MD-VOP probes for tape drives and allows you to place them manually.

- **Place by Drive Library Location SL3000 and SL8500)**

MD-VOP probes for tape drives and place them in the appropriate slots.

- **Sequential IP Drive Placement**

MD-VOP probes for tape drives and places them sequentially by slot.

These methods are described in the following sections.

### ***Detect and Place Drive Manually***

To perform the probe:

1. Click on Library Probe Operations and select Probe IP Range for Drives. The Probe for Drive Location dialog box appears.
2. Click Detect and Place Drive Manually radio button.
3. In the Initial Tape Drive IP Address field, enter the starting IP address.
4. In the IP Range Count field, specify an IP Range Count or click the Rest of Subnet button to automatically change the IP count to extend to the last IP address in the subnet.
5. Click the Probe button. MD-VOP scans the library and then the following screen appears:

**FIGURE 7-3** Manual Drive Placement Screen

IP Address	DMOD Number	Type
172.18.18.248	5700GU000033	T9840D
172.18.18.250	531004002696	T10000A
172.18.18.251	570001000153	T9840D

61	62	63	64
57	58	59	60
53	54	55	56
49	50	51	52
45	46	47	48
41	42	43	44
37	38	39	40
33	34	35	36
29	30	31	32
25	26	27	28
21	22	23	24
17	18	19	20
13	14	15	16
9	10	11	12
5	6	7	8
1	2	3	4

**Legend**

- Slot Selected
- Slot Defined in Spreadsheet
- Slot Unselected

Sort by IP    Undo  
Sort by Type    Skip

Done    Restart    Cancel

Detected tape drives are listed on the left. Library slots are shown on the right.

You can use the following buttons to sort the list of detected tape drives:

**Sort by IP**

Sort the list of tape drives by IP address.

**Sort by Type**

Sort the list of tape drives by drive type.

**Undo**

Undo the last tape drive placement operation, returning the tape drive to the list of detected tape drives.

**Skip**

Skip the tape drive at the top of the detected drives list.

6. Click on a slot to assign the first tape drive to the library.
7. Repeat [Step 6](#) for the remaining tape drives in the list.
8. When you are finished, click **Done**. Otherwise, click **Restart** to clear your changes, or click **Cancel** to exit the operation.

When you click **Done**, the drive information is added to the drive definition spreadsheet.

***Place by Drive Library Location (SL3000 and SL8500)***

To perform the probe:

1. Click on **Library Probe Operations** and select **Probe IP Range for Drives**. The **Probe for Drive Location** dialog box appears.
2. Click the radio button for **Place by Drive Location (SL3000 and SL8500)**.
3. In the **Initial Tape Drive IP Address** field, enter the starting IP address.
4. In the **IP Range Count** field, specify an **IP Range Count** or click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.
5. Click the **Probe** button. A progress window appears as MD-VOP begins to probe each IP address in the specified range to locate any tape drives. If you wish to cancel this operation, click the **Abort Probe** button at any time.
6. When the probe completes, an informational window appears, indicating the number of tape drives that were located and placed and the number of tape drives that were unable to be placed. You have the option to manually enter the unsuccessful tape drives.
7. Click **OK**.

### ***Sequential IP Drive Placement***

To perform the probe:

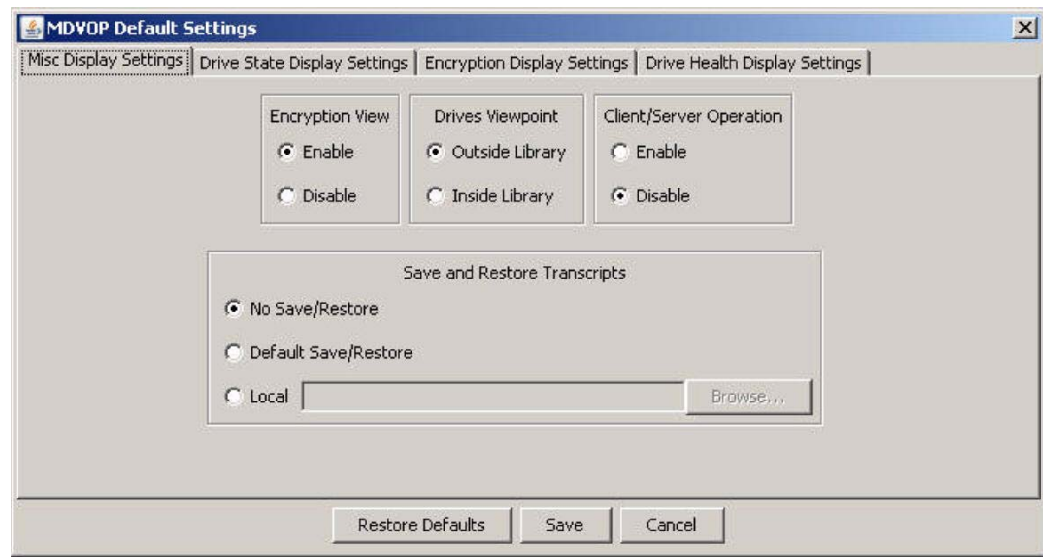
1. Click on **Library Probe Operations** and select **Probe IP Range for Drives**. The **Probe for Drive Location** dialog box appears.
2. Click the radio button for **Sequential IP Drive Placement**.
3. In the **Initial Tape Drive IP Address** field, enter the starting IP address.
4. In the **IP Range Count** field, specify an **IP Range Count** or click the **Rest of Subnet** button to automatically change the IP count to extend to the last IP address in the subnet.
5. Click the radio button for **Sequential IP Drive Placement**.
6. In the **First Library Slot to Use** field, enter the library slot number where counting is to begin.
7. Click the **Probe** button. A progress window appears as MD-VOP begins to probe each IP address in the specified range to locate any tape drives. Sequential IP addresses are placed starting at the slot you specified in [Step 6](#). If you wish to cancel this operation, click the **Abort Probe** button at any time.
8. When the probe completes, an informational window appears, indicating the number of tape drives that were located and placed and the number of tape drives that were unable to be placed. You have the option to manually enter the unsuccessful tape drives.
9. Click **OK**.

## Changing MD-VOP Default Settings

From the MD-VOP Dashboard, click on the File menu and select **Default Settings** to access the Default Settings screen. Use this screen to change the default MD-VOP display settings.

The following figure shows the MD-VOP Default Settings screen:

**FIGURE 7-4** MD-VOP Default Settings Screen



As shown in [FIGURE 7-4](#), this screen includes the following tabs:

- Misc Display Settings
- Drive State Display Settings
- Encryption Display Settings
- Drive Health Settings

Use these tabs to customize your MD-VOP display options. Click on a tab to make it active.

Additionally, this screen includes the following buttons:

### Restore Defaults

Restores default settings.

### Save

Saves current settings.

### Cancel

Cancels the operation.

**Note** – These buttons apply to all tabs.

## Misc Display Settings

Click this tab to view or edit general display settings.

As shown in [FIGURE 7-4 on page 74](#). This tab includes the following settings:

### Encryption View

Click radio buttons to enable or disable the Encryption tab and Encryption menu items in the MD-VOP main interface.

### Drives Viewpoint

Click radio buttons to specify whether the library view displays tape drives as if viewing from the front (inside) or back (outside) of the library.

### Save and Restore Transcripts

Click one of the following radio buttons to specify transcript settings:

#### No Save/Restore

Do not save transcripts. This is the default.

#### Default Save/Restore

Save transcripts in user directory `/.mdvop/transcript`.

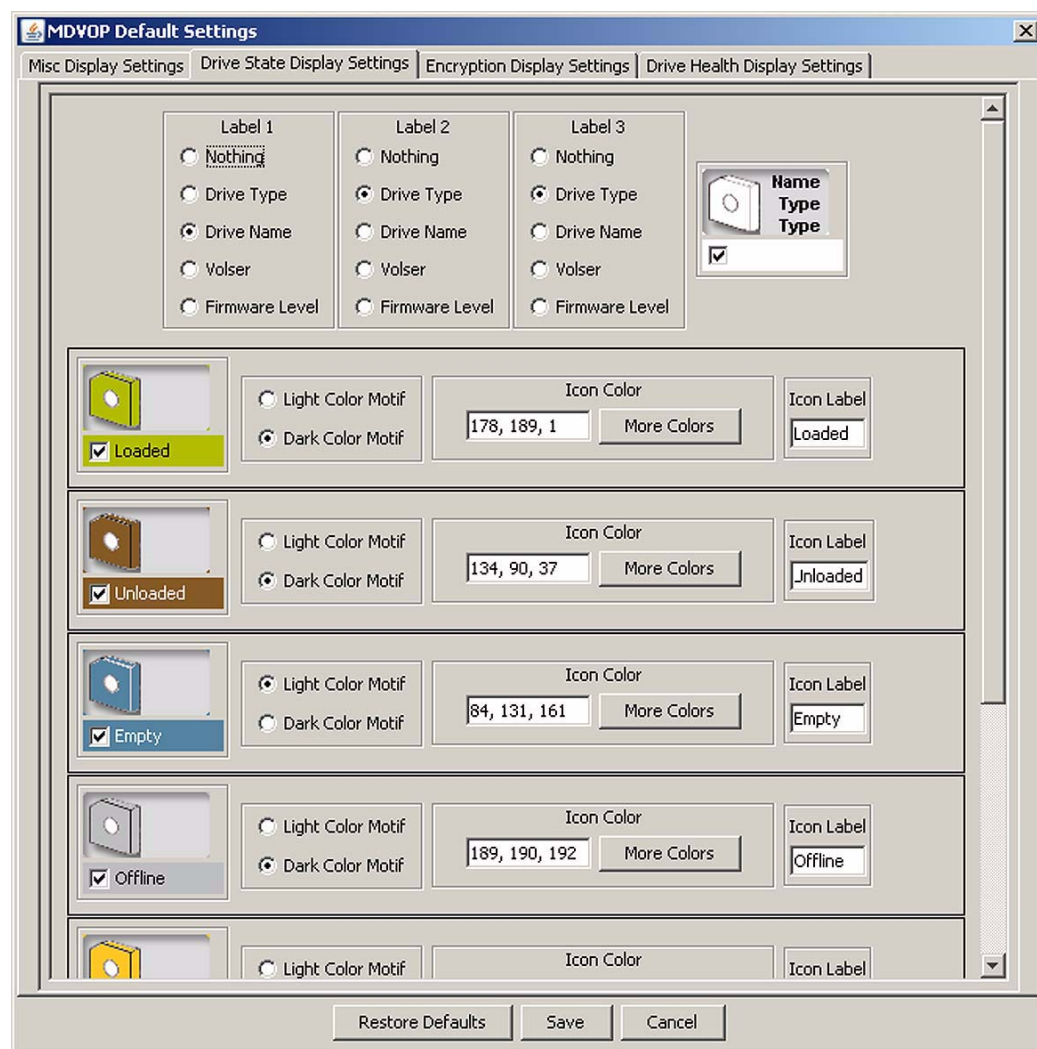
#### Local

Specify a new location where transcripts are saved.

## Drive State Display Settings

Click this tab to view or edit drive state display settings.

**FIGURE 7-5** Drive State Display Settings



As shown in [FIGURE 7-5](#), the Drive State Display Settings tab includes the following:

- Icon label settings
- Icon color settings

## Icon Label Settings

In MD-VOP, each tape drive icon includes three label fields that can display different drive attributes.

For each label (1-3), click one of the following radio buttons to define the attribute to be displayed on the icon:

### Nothing

Display nothing.

### Drive Type

Display the drive type.

### Drive Name

Display the drive name assigned on the Configuration screen.

### Volser

Display the volume serial number if a standard label tape cartridge is loaded.

### Firmware Level

Displays the firmware in the tape drive.

## Icon Color Settings

Additionally, this tab allows you to change the color setting and icon label for each drive state icon:

### Drive state display

For each drive state, click on the check box in the icon to show or hide the default display for that drive state.

### Color motif

Click on the radio buttons to select a light or dark color motif.

### Icon color

Enter an RGB value in the dialog box, or click more colors to choose from a palette.

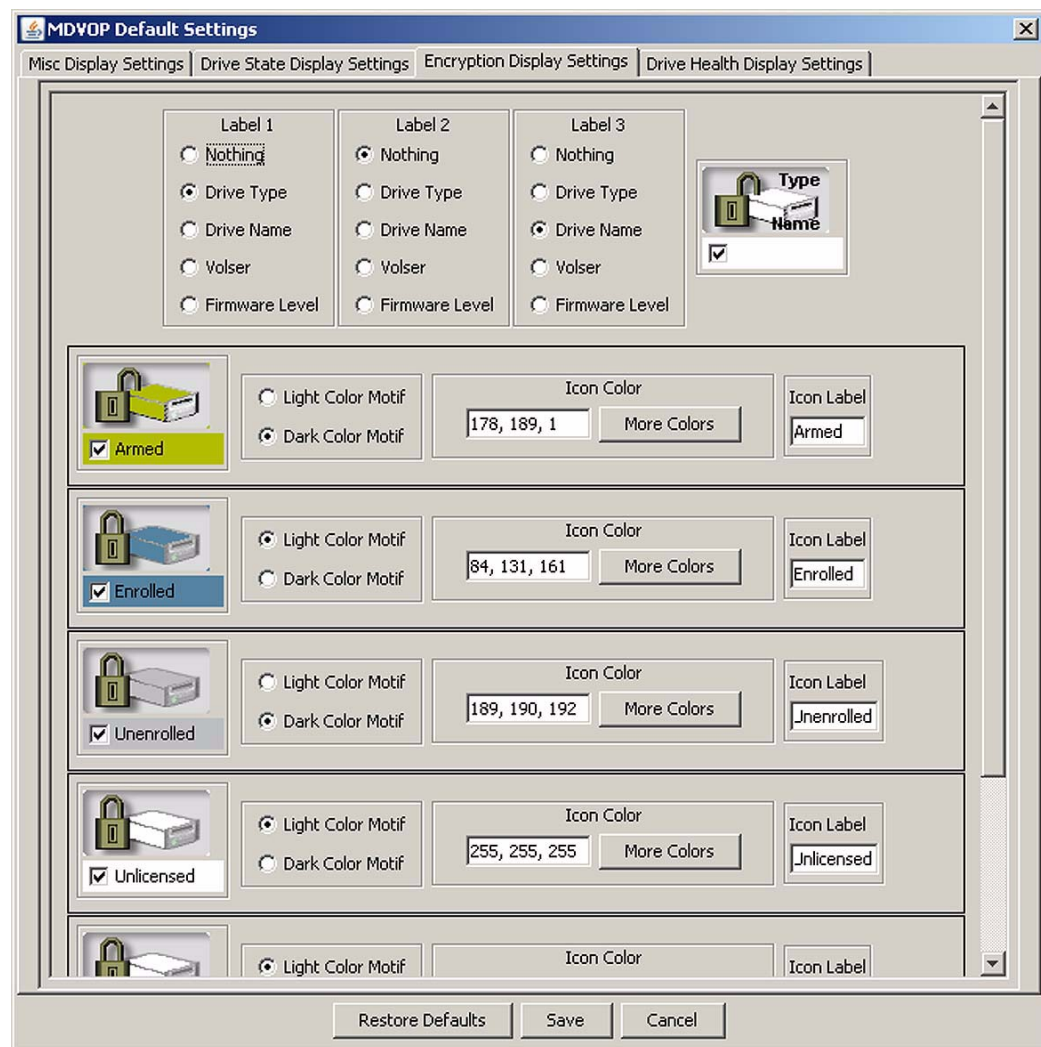
### Icon label

Enter label text in the dialog box. This text is displayed beneath the icon in the Library Panel legend.

## Encryption Display Settings

Click this tab to view or edit encryption display settings.

**FIGURE 7-6** Encryption Display Settings

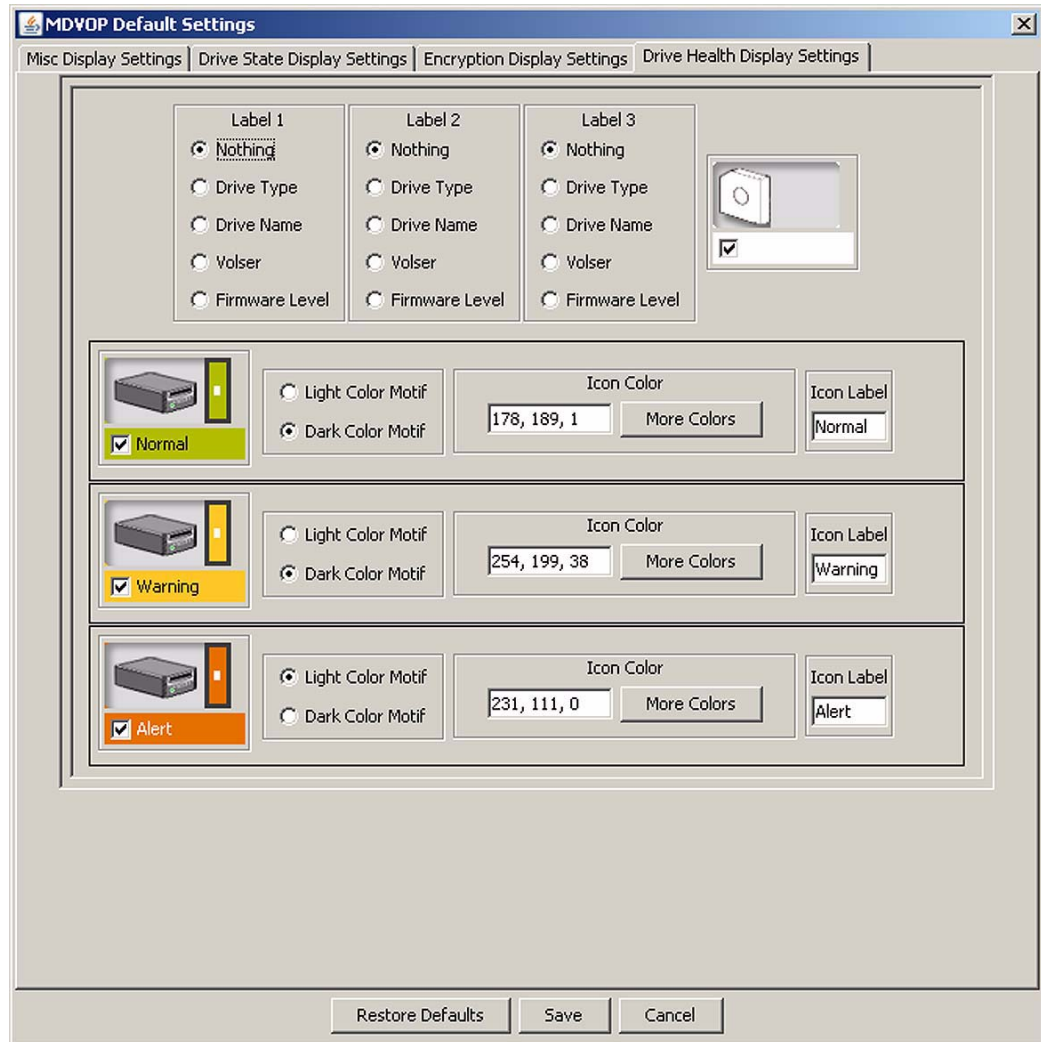


This tab shares the same options as the Drive State tab. See [“Drive State Display Settings” on page 76](#).

## Drive Health Display Settings

Click on this tab to view or edit encryption display settings.

**FIGURE 7-7** Drive Health Display Settings



This tab shares the same options as the Drive State tab. See [“Drive State Display Settings” on page 76](#).



---

## Using MD-VOP Library Panel Menus

Use MD-VOP menu commands to perform functions on one or more selected tape drives.

The Library Panel includes the following menus:

- [File Menu](#)
- [Drive Operations Menu](#)
- [Retrieve Menu](#)
- [Configuration Menu](#)
- [Encryption Menu](#)
- [Reports Menu](#)

**Note** – Depending on your access level, some menus may not be displayed.

## File Menu

The File menu includes the following commands:

### **Reconnect to Selected Drives in This Library**

MD-VOP attempts to reconnect to the selected tape drives in the library. Use this function after a network or tape drive issue is encountered.

### **Reconnect to Unconnected Drives**

MD-VOP attempts to reconnect to those tape drives with a failed network connection.

### **Refresh Icons in the Library**

Refreshes tape drive icons to the last known state.

### **Clear Library Transcript**

Clears the current library transcript (log).

### **Clear All Drive Transcripts**

Clears all tape drive transcripts (logs) for the selected library.

# Drive Operations Menu

The Drive Operations menu includes the following commands, used to control the function of one or more selected tape drives. These commands may have disruptive consequences. Therefore, you are prompted to continue before a command is executed.

**Note** – Online, offline, load, and IPL stop all active backup jobs to the selected libraries.

## Health Analysis of Selected Drives in This Library

Performs a health check on selected tape drives. To view the results of this analysis, click the Drive Health View tab in the MD-VOP Library Panel. See [“Drive Health View” on page 48](#) for more information.

**Note** – The Health Analysis does not affect tape drive functioning.

## Set Selected Drives Online in This Library

Places selected tape drives in online state. This is the normal operational state.

## Set Selected Drives Offline in This Library

Places selected tape drives in offline state. This state is designed for tape drive maintenance.

## Load Tape Cartridges in This Library

Loads selected tape drives. A tape cartridge must be inserted in the tape drive, but not loaded.

## Unload Tape Cartridges in This Library

Unloads selected tape drives. The tape cartridge is dismounted. The tape remains in the tape drive, but is not threaded.

## IPL Selected Drives in This Library

Performs an IPL (Initial Power Load) of the selected tape drives. An IPL can result in the following:

- During an IPL, the tape drive is reported as not available to MD-VOP.
- If a tape is present, the tape drive unloads the tape.
- If a tape is present, it may have an invalid MIR (degraded high speed access).
- Any I/O on the data path stops. Depending on the backup/archive application, the tape drive may require several minutes to recover.

## Retrieve Menu

The Retrieve menu includes the following commands, used to obtain or remove logs from selected tape drives. These commands are non-disruptive.

**Note –** This menu is only available in the system administrator version of MD-VOP.

### Retrieve ID Files in This Library

Retrieves a file that contains information about the global functioning of the selected tape drives.

### Retrieve Dump Logs in This Library

Retrieves a memory dump that contains the full state of the selected tape drives at the moment. A dump is a SNO (Should Not Occur) meaning that the firmware detected a state that could not be addressed.

### Retrieve Event Logs in This Library

Retrieves a log that contains the Fault System Codes (FSC) and events for the selected tape drives.

### Retrieve Perm Logs in This Library

Retrieves a log containing non-dump events.

### Retrieve All Logs in This Library

Retrieves all logs for the selected library based on the library IP address.

### Delete Dump Logs in This Library

Deletes the dump logs from the selected tape drives.

### Delete Event Logs in This Library

Deletes the event logs from the selected tape drives.

### Delete Perm Logs in This Library

Deletes the perm logs from the selected tape drives.

### Delete All Logs in This Library

Deletes all logs from the selected tape drives.

**Note –** It is recommended that you save logs before deleting them, as they can help in troubleshooting tape drive issues.

# Configuration Menu

The Configuration menu includes the following commands, used to configure the time on all selected tape drives in the library and load firmware from a file to the tape drives.

**Note** – This menu is only available in the system administrator version of MD-VOP.

## Set Clocks in This Library

Synchronizes time on the tape drives with that of the server. This is a non-disruptive operation.

## Firmware Update from File in This Library

Loads firmware from a user-specified file to a tape drive. See [“Performing a Firmware Update”](#) below.

# Performing a Firmware Update

## Considerations

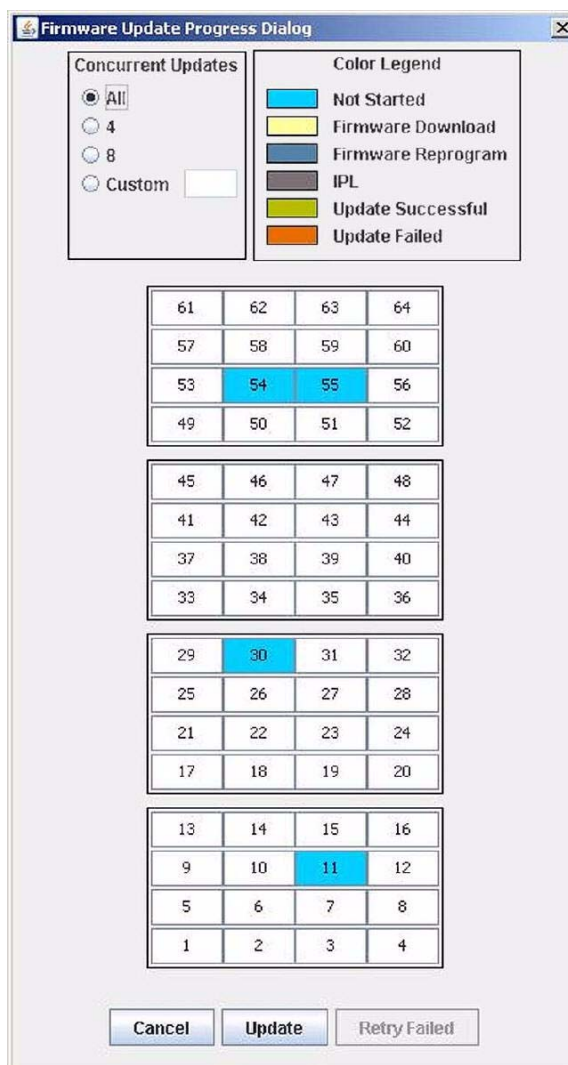
Before loading firmware from a file, consider the following:

- Do not IPL (reboot) a tape drive during a firmware update. Doing so can potentially cause the tape drive to become unusable.
- Only T10000, T9840D, and LTO 4 tape drives may be updated through the network interface.
- The tape drives you select for a firmware update must be of the same drive type.
- The tape drive checks the file being transferred and disregards firmware files that are not valid for that tape drive.
- You can load up-level or down-level firmware, without the dependencies of intermediate firmware.
- When the Code Load from File screen is displayed, the MD-VOP main interface is still visible and selectable, depending on the operating system. The interface will update, however, the menu items are disabled.
- You must manually check a T9840D to be offline before performing a firmware update. Otherwise, the tape drive will immediately display a failed indication in the firmware display.
- Firmware updates may fail, depending on network and other conditions. Once a firmware update completes, always check the selected tape drives to verify that the firmware was transferred successfully.

## To Load Firmware from a File to a Tape Drive

1. Select one or more tape drives that are to receive new firmware. The tape drives you select must be of the same drive type.
2. Click the Drive Operations menu and select Set Selected Drives Offline.
3. Click on the Configure menu and select Firmware Update from File in This Library. A Code Load from File screen appears.
4. Locate and click on the firmware file, and click the Open button.
5. Click the Update button. The Firmware Update Progress dialog box appears, displaying the tape drives that are selected for a firmware update.

**FIGURE 8-1** Firmware Update Progress Dialog



6. Click on a radio button to select one of the following Concurrent Updates settings:

**All**

Update all selected tape drives at one time.

**4/8**

Update the selected tape drives in groups of four or eight, one group at a time.

**Custom**

Specify the number of tape drives to be updated at one time, before the next group is updated.

7. Click the Update button to begin transferring the firmware to the selected tape drives. The legend displays the results of each step of the process:

**Not started**

The firmware update has not started.

**Firmware Download**

The firmware is transferring to the tape drive.

**Firmware Reprogram (firmware update process has started)**

The firmware process has started.

**IPL**

The tape drive has rebooted.

**Update Successful**

The Firmware update succeeded.

**Update Failed**

The firmware update failed.

## Encryption Menu

The Encryption menu includes commands used to control mass encryption routines for tape drives in the selected library. This menu is only supported for Windows and Solaris operating systems.

**Note** – By default, the Encryption view is not displayed, unless you indicated to include it when you installed MD-VOP. You can activate this view using the MD-VOP Default Settings screen. See [“Changing MD-VOP Default Settings” on page 74](#) for more information.

The Encryption menu includes the following commands:

**Note** – Before using these commands, you must complete the tasks described in [“Encryption Command Requirements” on page 90](#).

### Create OKM Agents in the Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet and uses the information to create a new OKM agent. Tape drives are not affected.

### Modify OKM Agents in the Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet and uses the information to modify the existing OKM agent. Tape Drives are not affected.

### Enroll Drives in This Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet, and uses the information to enroll the tape drives. The following actions occur:

- a. MD-VOP interrogates selected tape drives to ensure that they meet entry conditions (e.g. offline, unloaded, and unenrolled).
- b. MD-VOP interrogates the OKM to ensure that all agents meet entry conditions.
- c. MD-VOP enrolls the tape drives with OKM.
- d. MD-VOP interrogates the OKM to ensure that all agents are in the enrolled state.

### Unenroll Drives in This Library

Using the DMOD numbers of the selected tape drives, MD-VOP locates the entry in the spreadsheet, and uses the information to unenroll the tape drives. The following actions occur:

- a. MD-VOP interrogates selected tape drives to ensure that they meet entry conditions (e.g. offline, unloaded, and unenrolled).
- b. MD-VOP interrogates the OKM to ensure that all agents meet entry conditions.
- c. MD-VOP resets the tape drives.
- d. MD-VOP sets the agents to unenrolled on the OKM.

**Set Drives to Unencrypting in This Library**

Unenrolls the tape drives from OKM.

**Compare OKM, Spreadsheet, and Drives in This Library**

Verifies that the OKM, spreadsheet, and tape drives are synchronized. Tape Drives are not affected.

**Create Spreadsheet Template**

Creates a spreadsheet template with drive fields populated for the selected tape drives. You must manually enter agent information.

**Create Spreadsheet Template with Agent Lookup**

Creates a spreadsheet template with drive fields populated for the selected tape drives. Agent information (except for passphrase) is populated with information retrieved from OKM.

**License Drives in This Library**

Performs license operation to enable encryption on multiple tape drives in parallel.

## Encryption Command Requirements

With exception of the License Drives in This Library command, Encryption menu commands require the following inputs before they can be issued:

- You must select the tape drives on which to perform the command operation.
- You are prompted to identify the tab-delimited .txt file or the encrypted .ect file that contains all of the drive and agent information. This information is used to exchange information with the security officer who controls OKM and the MD-VOP.
- You are prompted to select the directory that contains the certificates obtained previously from Oracle Key Manager (OKM).

### OKM Data File

You must create a tab-delimited (.txt) file that includes the required information to correlate OKM data with the intended tape drives. Use any spreadsheet program to create this tab-delimited file.

**Note –** In most spreadsheet programs, default cell format settings cause the DMOD (tape drive serial number) to be displayed in scientific notation. To correct this, set the format to text.

#### ***Required Columns***

You must include the following columns in the OKM data file:

##### **DMOD**

The tape drive serial number

##### **Key Group**

The OKM Agent key group

##### **Agent ID**

The OKM Agent ID

##### **Passphrase**

The OKM Agent passphrase

##### **OKM IP**

The IP address of the OKM attached to the tape drive

### Optional Columns

Optionally, you can include the following additional columns in the OKM data file:

#### OKM Site ID

A description of the OKM site server

#### Description

A description of the tape drive

#### Slot Number

The library location of the tape drive

#### Drive IP

The IP address (IPV4) of the tape drive

#### Drive Family Type

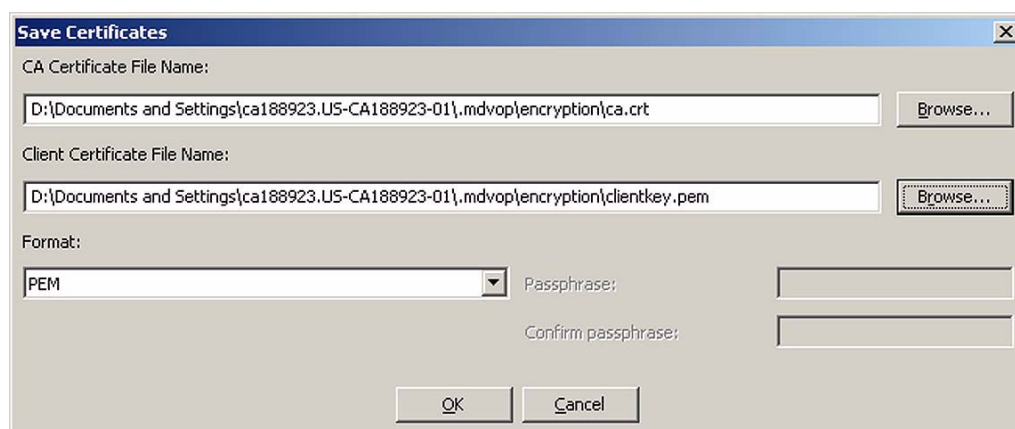
The type of tape drive

### Retrieving Certificate files from OKM

Before using the MD-VOP encryption commands, you must obtain the CA certificate and Client certificate files from OKM.

1. Launch the OKM GUI (version 2.3 or later).
2. Connect to OKM in the Operator role.
3. In the OKM GUI, click on the System menu and select Save Certificates. The Save Certificates dialog box appears.

**FIGURE 8-2** OKM Save Certificates Dialog



4. Enter the location on the MD-VOP host where certificates are to be stored. You must enter both the CA Certificate File Name and Client Certificate File Name.
5. Click the OK button to retrieve the certificate files from OKM.

## Reports Menu

The Reports menu includes the following commands, used to generate reports that describe the state of one or more tape drives. When you select one of these commands, MD-VOP prompts you for a location to save the report file.

**Note –** This menu is only available in the system administrator version of MD-VOP.

### Drive Status Report

Generates a report that provides general status information for all tape drives in the library.

### Encryption Report

Generates a report that provides information about the encryption settings for all tape drives in the library.

### Health Report

Generates a report that provides information about the health of all tape drives in the library. A separate report file is created for each selected tape drive.

### ASR Report

Generates a report that provides ASR status information including a summary of activation and any alerts sent.

---

## Using T10000 9840D VOP

This chapter describes how to use the T10000 9840D Virtual Operator Panel (VOP) with a single T10000 or T9840D tape drive.

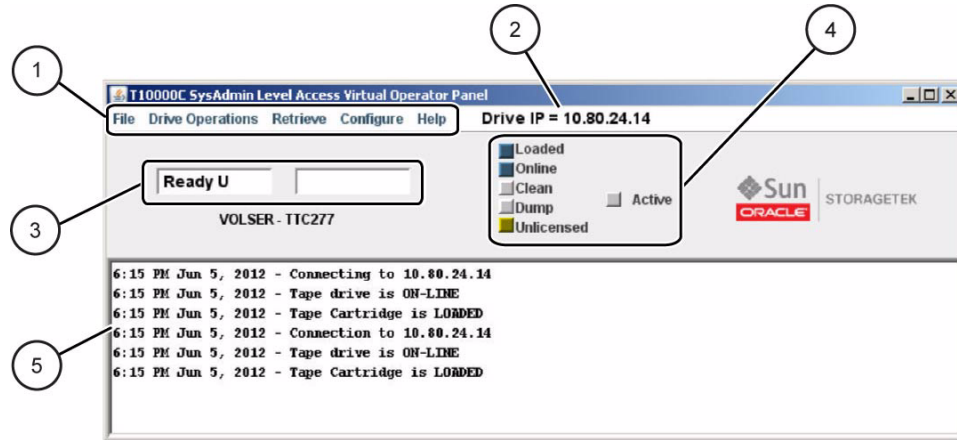
Designed for ease of use, the T10000 9840D VOP Graphical User Interface (GUI) allows you to do the following:

- Monitor tape drive status
- View or change tape drive configuration settings
- Perform tape drive operation utilities

# T10000 9840D VOP Interface

The following figure shows the T10000 9840D VOP main interface:

**FIGURE 9-1** T10000 9840D VOP Interface



1. Menus
2. Drive IP
3. Primary and Secondary Message Windows
4. Status Indicators
5. Transcript Pane

As shown in [FIGURE 9-1](#), the T10000 9840D VOP interface includes the following:

- **Menus**

Use menus to issue T10000 9840D VOP commands. See [“Using T10000 9840D VOP Menus” on page 95](#) for more information.

- **Drive IP**

Displays the IP address of the tape drive loaded.

- **Primary and Secondary Message Windows**

Display status messages during T10000 9840D VOP processing.

- **Tape Drive Status Indicators**

These indicators show the current drive state:

- The **Empty/Loaded** status indicator indicates whether a tape cartridge is loaded in the tape drive. When you load a cartridge in the tape drive, this status indicator changes from grey to blue, and indicates Loaded.
- The **Online/Offline** status indicator indicates whether the Ethernet adapter card is online. When you bring a tape drive online, this status indicator changes from grey to blue, and indicates Online.
- The **Clean** status indicator indicates that the tape drive needs to be cleaned.
- The **Dump** status indicator indicates that a dump is present for retrieval.

- The **Enabled/Unlicensed** status indicator indicates whether the tape drive is encrypted.
  - When a tape drive is encrypted and has all keys, the status indicator is orange, and indicates Enabled.
  - When a tape drive is missing an encryption key or has not been enrolled, the status indicator is red and indicates Unlicensed.

**Note –** You can click directly on certain status indicators to toggle the state of the monitored drive item.

- **Transcript Pane**

Displays a transcript of T10000 9840D VOP actions and prompts for additional input or actions.

## Using T10000 9840D VOP Menus

T10000 9840D VOP includes the following menus:

- [File Menu](#)
- [Drive Operations Menu](#)
- [Retrieve Menu](#)
- [Configure Menu](#)
- [Help Menu](#)

**Note –** Depending on your access level, some menus may not be displayed. Also, certain menus require the tape drive to be offline.

## File Menu

To open the File menu, click **File** in the menu bar or use the **ALT+F** keyboard shortcut.

**Note –** File menu commands are available when the tape drive is either online or offline.

The File menu includes the following commands:

### Clear Transcript

Clears the entire T10000 9840D VOP transcript pane and closes the file menu.

### Connect to Drive

Connects T10000 9840D VOP to the tape drive.

When the authentication dialog box appears, enter the tape drive IP address and click **OK**.

**Note –** Optionally, you can use the **SHIFT+C** keyboard shortcut from the File menu to issue this command.

### Collect Support Logs

Collects tape drive log files that you can forward to product support for analysis.

A text pane message appears after each log is collected, and a final message indicates the location of the archive (zip) message file.

**Note –** Optionally, you can use the **SHIFT+S** keyboard shortcut from the File menu to issue this command.

### Exit

Disconnects T10000 9840D VOP from the tape drive and closes the application.

**Note –** Allow a few seconds for the shutdown operation to complete.

## Drive Operations Menu

To open the Drive Operations menu, click **Drive Operations** in the menu bar or use the **ALT+D** keyboard shortcut.

**Note** – Refer to the *T10000 Tape Drive Operator's Guide* and the *T9840 Tape Drive User's Reference Manual* for additional information regarding the tape drive, use of a cartridge tape, and general operating procedures.

The Drive Operations menu includes the following commands:

**Note** – The tape drive must be encryption-enabled for some commands to appear.

### Load Tape

Loads a cartridge that is presently in the cartridge loading slot. A text pane message indicates that the tape cartridge is loaded.

**Note** – Optionally, you can use the **SHIFT+L** keyboard shortcut to issue this command from the Drive Operations menu.

### Unload Tape

Rewinds and unloads a loaded cartridge. A text pane message indicates that the tape cartridge is unloaded.

You must physically remove an unloaded cartridge from the tape drive by library robotics, or manually, from the rack mount configuration. Otherwise, the cartridge remains in the loading slot but is not loaded in the tape drive.

**Note** – Optionally, you can use the **SHIFT+U** keyboard shortcut to issue this command from the Drive Operations menu.

### Set Offline or Set Online

Changes the tape drive state.

- When the tape drive is online, this command indicates Set Offline.
- When the tape drive is offline, this command indicates Set Online.

You can also click the Online/Offline indicator to change the tape drive state.

**Note** – Optionally, you can use the **SHIFT+O** keyboard shortcut to issue this command from the Drive Operations menu.

### IPL Drive

Performs a tape drive initial program load (IPL).

If the tape drive is online, a confirmation dialog box appears.

**Note** – During the IPL, VOP loses communication with the tape drive. Once the IPL is successfully completed, VOP automatically reconnects with the tape drive.

### **Force Dump**

Dumps the current contents of various drive registers to a file.

The tape drive stores the dump to internal memory, and the dump status indicator changes to orange. The forced dump operation causes a tape drive IPL, during which VOP loses connection with the tape drive. Once the IPL is successfully completed, FFFA appears in the secondary drive message window.

### **Format Tape**

Launches the Format Tape Cartridge dialog box you can use to run the following formatting utilities:

- Make data tape
- Make code tape
- Make dump tape
- Rebuild MIR

See [“Using the Format Tape Command” on page 99](#) for information about these utilities and how to run them.

### **Identify Drive On**

Causes the Drive Status indicator on the rear panel of the tape drive to flash.

- On a T10000A/B tape drive, the indicator uses a fast flash rate
- On a T10000C tape drive, the indicator changes color between green and blue.

The indicator flashes for five minutes.

### **Identify Drive Off**

Stops an Identify Drive On command, and the Drive Status indicator returns to the previous state.

### **Set Power Hibernate (T10000C tape drives only)**

Forces the T10000C tape drive into the hibernation state. The status indicator to the right of the Dump indicator turns grey and indicates Hibernate.

### **Set Power Active (T10000C tape drives only)**

Forces the T10000C tape drive out of the hibernation state. The status indicator to the right of the Dump indicator turns blue and indicates Active.

**Note** – It takes approximately 20 seconds for the tape drive to wake from the hibernation state.

## Using the Format Tape Command

To Format a Tape Cartridge:

1. **Make sure the tape drive is offline.**

Use one of the following methods to set the tape drive offline:

- Click the **Online** status indicator.
- Open the Drive Operations menu and click the **Set Offline** command.
- Use the keyboard shortcut **ALT+D** to open the Drive Operations menu, followed by **SHIFT+O** to set the drive offline.

2. **Click the Drive Operations menu and select Format Tape. The Format Tape Cartridge dialog box appears.**

3. **Select the utility you wish to run:**

- **Make data tape**

This utility reformats a tape cartridge for re-use as a data tape cartridge. Existing headers are removed and the Media Information Region (MIR) is rewritten to identify the cartridge as empty, and therefore ready for write operations.

- **Make code tape**

This utility reformats a tape cartridge in a special format, and downloads the tape drive firmware from tape drive memory to the tape cartridge. The MIR is then written to identify the cartridge as a code tape. You can use the code tape to upload tape drive firmware to other tape drives.

- **Make dump tape**

This utility reformats a tape cartridge in a special format. The MIR is written to identify the cartridge as a dump trace. You can use a formatted dump tape to download diagnostic dump data from drive memory.

- **Rebuild MIR**

Use this utility to rebuild a data tape cartridge that has an invalid or corrupted MIR. The utility reads the file headers to the end of the Data mark. Then, the MIR is rewritten to correctly reflect the tape contents. This utility can take over one hour to rebuild the MIR on a full or nearly full data cartridge. Refer to the *T10000 Tape Drive Operator's Guide* for more information about MIR.

4. **Click the Make button or use the ALT+M keyboard shortcut to run the selected utility.**

A prompt appears in the transcript pane, directing you to insert a cartridge. If there is a cartridge in the tape drive, it unloads. You must physically remove the cartridge.

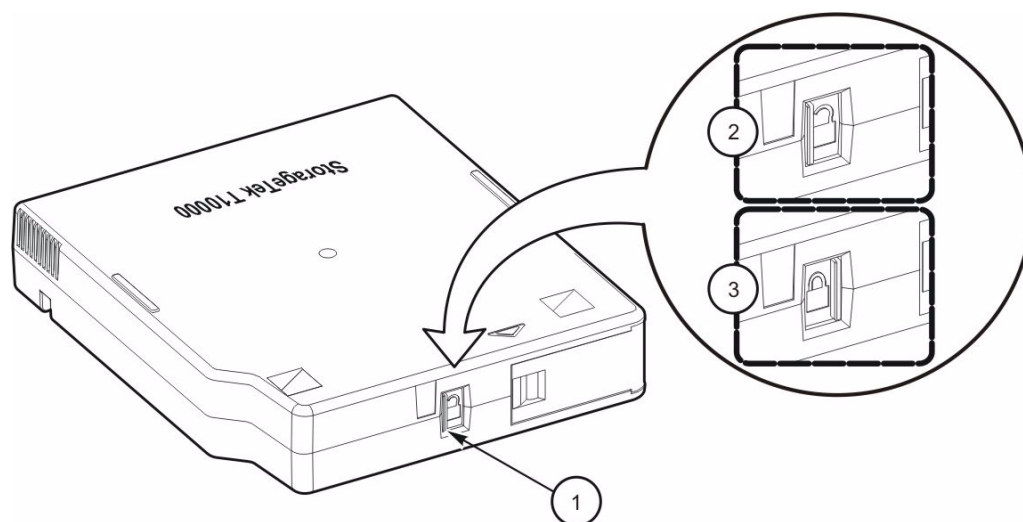
**Note –** Before inserting the cartridge, you can cancel the selected utility by clicking the **ABORT** button or using the **ALT+A** keyboard shortcut. Once the cartridge is inserted, the utility runs to completion.

**Caution –** Do not use the Make Code Tape or Make Dump Trace functions with a customer data tape.

**5. Insert a write-enabled cartridge.**

Make sure the cartridge's write protect switch is in the write-enabled position as indicated by the open padlock icon.

**FIGURE 9-2** Tape Cartridge Write Protect Switch



T103\_409

1. Write-protect Switch
2. Unlocked (write-enabled) Position
3. Locked Position

When you insert a cartridge, the tape drive performs the selected utility, displays related information in the VOP transcript pane, and then unloads the cartridge.

**6. Remove the unloaded cartridge.**

**7. Click the DONE button to exit.**

## Retrieve Menu

To open the Retrieve menu, click **Retrieve** in the menu bar or use the **ALT+R** keyboard shortcut.

The Retrieve menu includes the following commands:

### View Drive Data

This command opens the View Current Drive Settings dialog box. Use the tabs in this dialog box to view current tape drive configuration settings and other tape drive data. When you're finished, click **OK** or use the **ALT+O** keyboard shortcut to close the dialog box.

This command is only available when the tape drive is offline.

Use this command for viewing purposes only. To change current tape drive settings, use the Configuration menu. See ["Configure Menu" on page 103](#).

**Note** – Optionally, you can use the **SHIFT+V** keyboard shortcut to issue this command from the Retrieve menu.

The View Current Drive Settings dialog box includes the following tabs:

- **Encrypt** (encryption-capable tape drive)  
Displays encryption related data.  
For additional information on FIPS aspects of the tape drive, refer to the following publications:
  - *T10000A Encrypting Tape Drive Security Policy*
  - *T10000B Encrypting Tape Drive Security Policy*
  - *T10000C Encrypting Tape Drive Security Policy*
- **Fibre**  
Displays information specific to the tape drive interface.
- **Keyid** (encryption-capable tape drive)  
Displays a list of key identifiers.
- **Maintenance**  
Displays maintenance settings and whether or not they are enabled.
- **Manufacturing**  
Displays factory preset settings, including drive serial number, and default world wide names.
- **Missing** (encryption-capable tape drive)  
Displays a list of missing key identifiers.

- **Network**

Displays a network node name. The factory preset default is comprised of the tape drive model number, T10000 for example, and the last nine digits of the tape drive serial number.

This tab also displays the current static IP settings.

- **Power**

Displays current delay time setting for automatic hibernation, and whether hibernation is enabled for the T10000C tape drive.

- **Rfid**

Displays data stored in the radio-frequency identification (Rfid) memory chip in the T10000 tape cartridge. The Rfid chip stores data related to cartridge contents and statistics. This data is similar to data stored in the media information region (MIR) on the tape, and is updated with each cartridge mount/dismount. An Rfid module in the tape drive reads the Rfid chip while the cartridge is loaded, and is viewable (read-only) by the VOP application.

- **Version**

Displays tape drive-specific firmware and hardware levels.

### **View Date & Time**

Displays an entry for the tape drive's internal timer setting in the VOP transcript pane. For example:

```
8:55 AM Aug 2, 2010 - VOP LOGGED IN to Drive
8:59 AM Aug 2, 2010 - Tape Drive Clock set to 07/30/2010 11 11:52:44:670
```

Notice the tape drive clock setting (8:59) is behind the VOP time on the same text line. The tape drive clock only operates while the tape drive is powered.

Therefore, when the tape drive is not powered, the tape drive clock time can fall behind real clock time. Most library configurations set the drive clock in sync with the library clock.

### **ID File to File**

Retrieves and saves the ID file to the ID folder in the VOP directory.

### **Dumps to File**

Retrieves diagnostic dumps that are currently stored in the drive memory, and allows you to save the dumps in a specified location. After you save the dump file, an entry is displayed in the VOP transcript pane. For example:

```
8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:Dmp 1
8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:DMP 1
9:00 AM Aug 2, 2010 - Retrieve Dumps in Progress
9:00 AM Aug 2, 2010 - Dumps RETRIEVED to D:\T10B_dump_aug2
```

### **Perms to File**

Retrieves all the permanent errors that are currently stored in the drive memory, and allows you to save the error log in a specified location.

**Logs to File**

Retrieves event logs that are currently stored in the drive memory, and allows you to save the event logs in a specified location.

## Configure Menu

To open the Configure menu, click **Configure** in the menu bar or use the **ALT+C** keyboard shortcut.

The Configure menu includes commands used to change and save configuration settings, set the time on a tape drive, and load firmware from a file or tape.

**Note –** With the exception of the Set Clock command, these commands are only available when the tape drive is offline. The tape drive should not be available to the host when you exercise any change that results in the tape drive performing an Initial Program Load (IPL) to implement the configuration change.

The Configure menu includes the following commands:

**Drive Data**

This command opens the Configure Drive Parameters dialog box. Use this dialog box to change and save your configuration settings. See [“Configuring Drive Data” on page 104](#) for more information.

**Note –** Optionally, you can use the SHIFT+D keyboard shortcut to issue this command from the Configure menu.

**Save Drive Config**

Saves the current tape drive configuration settings to a file. You can retrieve the saved file to restore configuration settings.

**Set Clock**

Sets the tape drive’s internal clock to the current time in your computer. Once the clock is set, an entry is displayed in the VOP transcript pane.

**Firmware Update from File**

Loads firmware from a user-specified file to a tape drive.

**Firmware Update from Tape**

Loads firmware from a pre-recorded code tape (cartridge) to a tape drive.

During the update process, you are prompted to insert and remove the code tape cartridge containing the proper firmware release firmware level. When the update is complete, use the Version tab in the Retrieve menu to confirm the updated firmware level.

## Configuring Drive Data

Click on the Configure menu and select the **Drive Data** command to display the Configure Drive Parameters dialog box.

**Note –** This command is only available when the tape drive is offline.

Use the tabs in this dialog box to access different configuration settings. Each tab includes fields to specify configuration settings, and buttons to perform related operations.

To change a setting, enter a new value in a field. The accompanying Update check box is automatically selected to indicate a change.

Once you have made your changes, do either of the following:

- Click the **Commit** button or use the **ALT+C** keyboard shortcut to commit your changes.

If you decide against a value entered, uncheck the Update box and the Commit operation ignores it.

- Click the **Cancel** button or use the **ALT+N** keyboard shortcut to cancel all pending changes.

### Tabs

The Configure Drive Parameters dialog box includes the following tabs:

#### Encrypt

Use this tab to change tape drive encryption characteristics and enrollment information.

Refer to the *T10000 Tape Drive Operator's Guide* for information about the use of Data Path Key Management (DPKM).

For additional information on FIPS aspect of the tape drive, refer to the following publications:

- *T10000A Encrypting Tape Drive Security Policy*
- *T10000B Encrypting Tape Drive Security Policy*
- *T10000C Encrypting Tape Drive Security Policy*

#### Fibre

Use this tab to change tape drive-specific Fibre Channel configuration settings.

## Network

Use this tab to change network configuration settings, including the IPv4 address and network node name.

**Note** – These settings are preset during manufacturing, and should only be changed at the direction of your IT manager.

- To change the static IPv4 address, enter new values for IP address, Subnet mask, and Gateway, and click the **Commit** button.

Each parameter consists of four, three digit groups. For example:

010.000.000.001

For each three-digit group, you can enter a value from 000 to 255.

**Note** – If your tape drive is monitored by a Service Delivery Platform (SDP), the SDP incorporates a dynamic host control protocol (DHCP) server that assigns a dynamic IP address to the tape drive.

- To change the network node name, overwrite the existing value and click the **Commit** button.

The factory preset network node name for a T10000 tape drive is:

t10000-<last nine digits of drive serial number>

## Power (T10000C only)

Use this tab to enable/disable auto hibernation and specify the auto hibernation delay time, from 0 to 60 minutes.

T10000C auto hibernation is designed to save power when a cartridge has not been mounted for a specified period of time. Normally, the library monitors whether a tape drive is hibernating and directs a tape drive to wake up whenever a mount is about to occur.

## Security (T10000C only)

Use this tab set or change the tape drive password.

To change your password, enter the current password and new password, re-enter the new password, and then click the **Commit** button.

**Note** – If the tape drive password has not previously been changed, enter default for the current password.

New passwords must be 8-16 characters, and must include each of the following character types:

- Upper case character
- Lower case character
- Number
- Special character

**Note** – ! @ # \$ % ^ & \* ( ) { } [ ] + = - \_ are valid special characters.

## **Buttons**

The Configure Drive Parameters dialog box includes the following buttons:

### **Load Drive Config**

Click this button or use the **ALT+L** keyboard shortcut to import a previously saved configuration file. After the imported file is opened, all tabs are populated with the saved configuration settings. Marked Update check boxes identify changed settings.

Make any necessary changes to settings, and then click the **Commit** button or use the **ALT+C** keyboard shortcut to save your settings.

**Note –** The imported configuration file includes parameters specific to the originating tape drive. Be sure to clear or reset tape drive-specific parameters to accurately reflect the tape drive that imported the saved configuration file.

### **Commit**

Click this button or use the **ALT+C** keyboard shortcut to initiate an IPL to save and activate all pending changes.

**Note –** When you click the **Commit** button, only those fields with an active check box are updated.

During the commit process, VOP loses connection to the tape drive when IPL begins. However, VOP automatically reconnects to the tape drive after successful IPL.

Click this button to save the configuration settings in NVRAM. The Ethernet card reboots when you change an IP setting.

**Note –** When you click the **Commit** button, only those fields with an active check box are updated.

### **Cancel**

Click this button or use the **ALT+N** keyboard shortcut to unselect all pending setting changes.

## **Drive Data Settings**

The following provides additional information about the tape drive data settings included in the Configure Drive Parameters dialog box.

### **Emulation**

Available emulation options are dependent on the active interface, tape drive model, and firmware version.

### **Data Compression**

The following describes data compression options:

**Note –** The option defaults to the last saved selection.

#### **No**

Data is not compressed, but can be overridden by the host for a job.

#### **Yes**

Data is compressed, but can be overridden by the host for a job. This is the factory default setting.

#### **Off**

Data compression is disabled, and cannot be overridden by the host.

### **Data Security Erase**

The following describes data security erase options:

#### **Yes**

Enables a full data security erase. A random binary pattern is written on the media, over-writing existing data, from the point of an “Erase” command to the End of Tape mark. This is the factory default.

#### **No**

Writes an end of tape mark on the media that indicates valid data does not exist beyond the point of an “Erase” command. Data is actually still present beyond the end of data mark, and it can be retrieved by special tape utilities.

### **Standard Label Protect**

The following describes standard label protect options:

#### **Yes**

Enables standard label protection.

- Select **Yes** if label overwrite code is loaded, or if running standard labels and wish the tape drive to display a fatal error (CHK 33EX) when writing a non-80-byte record for VOLSER or HDR1.
- POST WRCART cannot be run with Yes selected.

**No**

Disables standard label protection. This is the factory default.

Select **No** if you are using NL or NSL tape processing.

**Library Address**

The library address text field contains a two-character hexadecimal value set to *ff* at the factory.

This setting should remain at *ff* for all libraries except for the 9310 Powderhorn library, where the address is keyed to the drive cabinet position, as viewed from the cabinet rear.

Valid entries for the 9310 Powderhorn Library 9741/9741E drive cabinet are 00-09 (top, down), left column; and 0A-13 (top, down) right column.

**Tape Completion Display**

This setting determines whether tape completion percentages are displayed in the SDVOP secondary window when a tape cartridge is loaded in the tape drive.

**Note** – This display is superseded by higher priority messages that display in the SDVOP secondary window.

**Yes**

Tape completion percentages are displayed.

**No**

Tape completion percentages are not displayed.

**Language**

This setting specifies the language in which certain operational messages (loading, unloading, etc.) appear in the SDVOP drive message windows. The following languages are supported:

- English (the default)
- Espanol
- Francais
- Italiano
- Deutsch

## World Wide Name

**Caution** – Indiscriminately changing the WWN could result in the tape drive being unavailable to the host.

The World Wide Name (WWN) identifies the tape drive node. This string of 16 hexadecimal characters represents a 64-bit, unique identifier that distinguishes the individual tape drive from all other devices worldwide. Characters 2 through 6 identify the specific manufacturer. Oracle StorageTek branded devices have the company ID “00104F”. Other characters reveal additional tape drive-specific information.

The custom label indicates that a customized WWN is active.

The (default) label indicates that the WWN was preset at the factory. For example:

World Wide Name (default) : 50:01:04:f0:00:93:c6:9d

Manufacturing assigns a block of three WWNs (from a pool of company-specific WWNs) to each tape drive during the manufacturing process. One for the tape drive and one each for the two fiber-optic interface ports. The tape drive node is assigned the first WWN of the block, and the next two WWNs, in sequence, are assigned to the ports.

Certain libraries override the default WWN with a library-assigned dynamic WWN (dWWN). Typically, only the last four characters differ from the default WWN. When dWWNs are active, (library) appears in the label.

You can also manually override the WWN with a custom WWN. In some circumstances, a service representative might customize a replacement tape drive’s WWN to be the same as the replaced, defective tape drive’s WWN. This precludes a requirement for a full system reset to acknowledge a new WWN.

If you apply a custom WWN to the tape drive node, you must also apply custom WWNs to the interface ports.

## Interface Port Attributes

Port physical address attributes are only used when the tape drive is in an arbitrated-loop. The settings are not applicable when the tape drive is in an interface fabric.

There are two identical interface port attribute groups:

- Pa = Port A
- Pb = Port B

## Hard-assigned Physical Address

### Yes

The tape drive uses a specified hard physical address (PA).

### No

The tape drive seeks a soft PA. This is the default.

### **Arbitrated Loop Address (loop ID)**

This entry (0 - 125) specifies the loop ID when the Hard PA selection is Yes. Factory-preset defaults are: 0 for Port A, 1 for Port B.

### **Soft-assigned Physical Address (Hi/Lo)**

**Note** – Soft PA is valid when the Hard PA selection is No.

#### **Hi**

The tape drive seeks an available loop ID in a descending order.

#### **Lo**

The tape drive seeks an available loop ID in a descending order. This is the default.

### **Maximum Receive Size**

**Caution** – POTENTIAL DRIVE DAMAGE. Older versions of VOP display several size options. The smaller size options are not valid with the T10000 tape drive. Furthermore, an attempt to switch to any setting other than 2112 or 2048, could cause the tape drive to fail to complete the IPL. DO NOT select a size option other than 2112 or 2048.

The maximum receive (max rcv) size value determines the maximum data frame size for data processing. There are two values:

- 2112
- 2048

2112 is the factory setting. Do not change this value unless directed by your IT Manager or StorageTek support representative.

**Note** – The option defaults to the last saved selection.

### **World Wide Name Override**

Each port has a unique WWN that you can override. See [“World Wide Name” on page 109](#) for additional information.

If you apply a custom WWN to the tape drive node, you must also apply custom WWNs to the interface ports.

**Note** – When a customized WWN is active, (custom) appears in the label.

### ***Speed Negotiation***

**Note** – Do not change the speed setting unless directed by your IT manager or StorageTek Support.

The Speed Negotiation options depend on the capability of the interface transceiver present in the tape drive. The following options are available for a 4 Gbit tape drive:

- Auto
- 1GB
- 2GB
- 4GB

When you select **Auto**, the tape drive operates at the negotiated interface speed, which is typically determined by the slowest attached device. Auto is preset at the factory.

When you select a fixed rate, the tape drive only operates at the specified speed and might cause the tape drive to be unavailable, unless all other interface devices are set to the same speed.

### ***File Sync Accel***

The StorageTek File Sync Accelerator (FSA) allows applications to reduce or eliminate back hitches that are normally caused by writing a tape mark or other sync operations. Click the appropriate button to enable or disable the feature.

### ***Tape App Accel***

The StorageTek Tape Application Accelerator (TAA) avoids back hitches by converting tape marks to buffered tape marks and syncs to NO-OPs. The feature is only available with FICON. Click the appropriate button to enable or disable the feature.

This feature must only be used in environments that handle deferred errors. When this feature is enabled, sending a tape mark does not ensure that data has successfully been written to the tape. A deferred error may be reported when buffered data is written to tape after the command has completed. In a FICON only environment, duplex write operations should use this feature.

### ***Max Capacity***

Maximum capacity allows the use of tape capacity that is normally reserved to ensure tape-to-tape copy operations succeed. Enabling this feature can increase cartridge capacity by five to ten percent.

## Help Menu

To open the Help menu, click **Help** in the menu bar or use the **ALT+H** keyboard shortcut.

**Note –** Help menu commands are available when the tape drive is either online or offline.

The Help menu includes the following commands:

### About

Displays a dialog box that provides the following information about the VOP application and environment.

- Role level access
- VOP Version
- VOP Build Date
- Drive Name (if a tape drive is connected)
- Drive Type (if a tape drive is connected)
- Java Version
- License Agreement

**Note –** Optionally, you can use the **SHIFT+A** keyboard shortcut to issue this command from the Help menu. To close the dialog, click **OK** or use the **ALT-O** keyboard shortcut.

### FSC Dictionary

Opens the FSC Look Up dialog box, used to perform a lookup in the Fault System Code (FSC) Dictionary.

**Note –** The FSC Dictionary is available with or without a tape drive connection.

When the FSC Look Up dialog box appears, enter an FSC number, select the dictionary for the tape drive model, and click the **LOOKUP** button. The fault system code description is displayed in the VOP transcript pane. For example:

```
FSC: A33A | NO TAPE IS | LOADED | ***  
MIM Code: NONE
```

```
FRU: OPER. ERROR CONF: 100%
```

Field Text:

The user requested motion operation that requires a tape to be installed, however, a tape has not been loaded.

---

## Using LTO VOP

This chapter describes how to use the LTO Virtual Operator Panel (VOP) with a single encryption-enabled HP or IBM Linear Tape Open (LTO) Ultrium LTO-4 or LTO-5 tape drive.

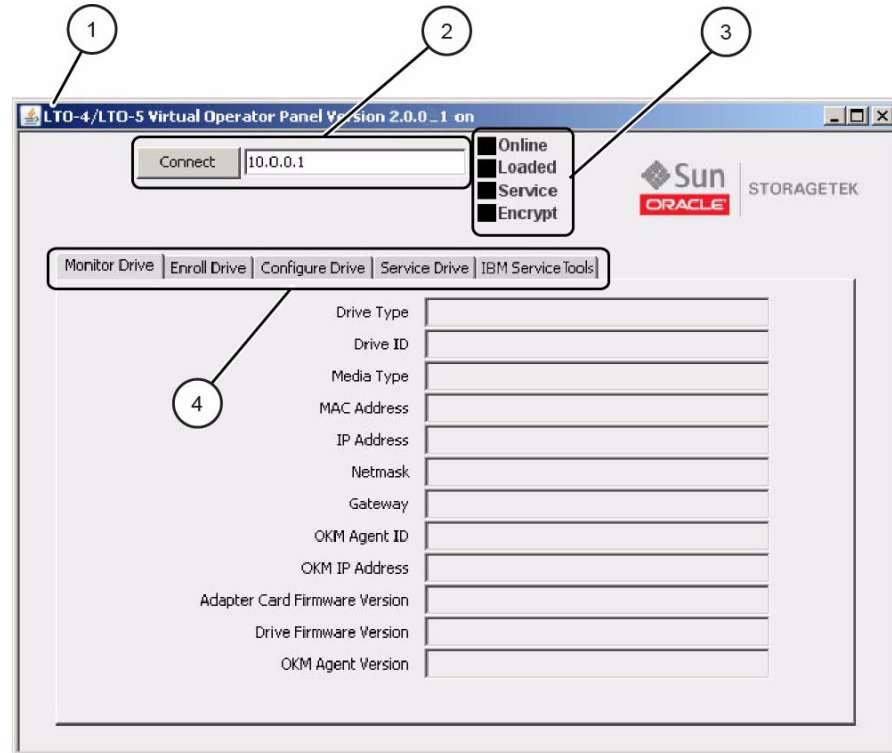
Designed for ease of use, the LTO VOP Graphical User Interface (GUI) allows you to do the following:

- Monitor tape drive status
- View or change tape drive configuration settings
- Perform tape drive service tasks

## LTO VOP Interface

The following figure shows the LTO VOP main interface:

**FIGURE 10-1** LTO VOP Interface



1. Title Bar (includes Menus)
2. Connect Button
3. Tape Drive Status Indicators
4. Function Tabs

As shown in [FIGURE 10-1 on page 114](#), the LTO VOP interface includes the following:

- **Title Bar**

Click the icon in the title bar to access a basic menu you can use to re-size the window and close the application.

- **Connect Button**

Enter the IP address of your LTO tape drive in the accompanying field and click the **Connect** button.

- **Tape Drive Status Indicators**

These indicators show the current drive state:

- The **Online/Offline** status indicator indicates whether the Ethernet adapter card is online. When you bring a tape drive online, this status indicator changes from grey to blue, and indicates Online.
- The **Empty/Loaded** status indicator indicates whether a tape cartridge is loaded in the tape drive. When you load a cartridge in the tape drive, this status indicator changes from grey to blue, and indicates Loaded.
- The **Service** status indicator indicates whether the Ethernet card is communicating with the tape drive.
- The **Encryption** status indicator indicates whether the tape drive is enrolled for encryption.

**Note –** You can click directly on certain status indicators to toggle the state of the monitored tape drive item.

- **Function Tabs**

These tabs provide functions used to configure, monitor, and service the tape drive. See [“LTO VOP Function Tabs” on page 117](#) for more information.

During the course of selected operations, the message pane located on the Service Drive tab displays a transcript of LTO VOP actions and prompts for additional input.

## Changing the Online/Offline Status of a Drive

Certain LTO VOP functions require the tape drive to be offline.

### ▼ To Change Drive Status to Offline

**1. Determine the current drive state.**

View the Online/Offline status indicator. If the tape drive is online, proceed with the next step. If the tape drive is offline, stop.

**2. Change the drive state to Offline using one of the following methods:**

- Click the first status indicator.
- Click the **Enroll Drive** tab and then click the **Set Offline** button.
- Click the **Configure Drive** tab and then click the **Set Offline** button.

**3. Verify that the tape drive is offline.**

The first Online/Offline status indicator is grey and is labeled Offline. In addition, the button in the Enroll Drive tab is labeled Set Online.

## Error Messages

Depending on conditions, certain LTO VOP functions result in error conditions. For example, an error occurs if you attempt to place the tape drive (adapter card) offline while a tape cartridge is loaded.

# LTO VOP Function Tabs

LTO VOP includes the following tabs used to perform various functions on the tape drive:

- [Monitor Drive](#)
- [Enroll Drive](#)
- [Configure Drive](#)
- [Service Drive](#)
- [IBM Service Tools](#)

These function tabs are described in the following sections.

## Monitor Drive

Click this tab to display a list of tape drive, cartridge, and OKM agent attributes and values for those attributes. Some attributes require an additional action, such as tape drive enrollment for encryption, before the associated data appears.

The following figure shows an example of the Monitor Drive page:

**FIGURE 10-2** LTO VOP Monitor Drive tab

Drive Type	HP LTO-5
Drive ID	HU1047DLRF
Media Type	
MAC Address	3C4A92:B0259E
IP Address	10.80.191.1
Netmask	255.255.255.0
Gateway	10.80.191.254
IPv6 Local Address	FE80::3E4A:92FF:FE80:259E/64
OKM Agent ID	hp1
OKM IP Address	10.80.46.92
Adapter Card Firmware Version	Version N/A
Drive Firmware Version	I3A5
OKM Agent Version	KMSAgentLibraryVersion:Build871

As shown in [FIGURE 10-2 on page 117](#), this page lists the following tape drive attributes:

- Drive Type
- Drive ID
- Media Type
- MAC Address
- IP Address
- Netmask
- Gateway
- IPv6 Local Address
- OKM Agent ID
- OKM IP Address
- Adapter Card Firmware Version
- Drive Firmware Version
- OKM Agent Version

## Enroll Drive

**Note** – Refer to your encryption documentation before using this page. The sequence for using the Configure Drive and Enroll Drive tabs is critical to success.

Click this tab to access functions used to specify enrollment settings and enroll the tape drive adapter card.

The following figure shows an example of the Enroll Drive page:

**FIGURE 10-3** LTO VOP Enroll tab

The screenshot displays the 'LTO-4/LTO-5 Virtual Operator Panel Version 1.0.18.2 on' window. At the top, there is a 'Connect' field containing '10.0.0.1' and four status indicators: 'Online', 'Loaded', 'Service', and 'Encrypt', each with a corresponding checkbox. The 'Enroll Drive' tab is selected, showing a 'Change Enrollment Settings' section with four input fields: 'OKM Agent ID', 'OKM IP Address', 'Passphrase', and 'Confirm Passphrase'. Each field has a checkbox to its right. At the bottom of the panel, there are four buttons: 'Set Offline', 'Commit', 'Enroll', and 'Cancel'.

As shown in [FIGURE 10-3](#), this page includes fields to specify enrollment settings, and buttons to perform related operations.

To change a setting, enter a new value in a field. The accompanying Update check box is automatically selected to indicate a change.

## Fields

The Enroll Drive page includes the following fields:

### **KMA Agent ID**

The KMA agent defined in OKM.

### **KMA IP Address**

The KMA service network address.

### **Passphrase**

The KMA agent passphrase defined in OKM.

### **Confirm Passphrase**

Confirmation of the KMA agent passphrase.

**Note –** Before you enroll a tape drive, you must create the agent with the passphrase assigned in the OKM. The OKM must be able to communicate with the adapter card and tape drive.

## Buttons

The Enroll Drive page includes the following buttons:

### **Set Offline**

Click this button to set the tape drive offline.

**Note –** The label on this button changes depending on the current drive state (for example, the label is Set Offline when the drive state is Online).

### **Commit**

Click this button to save the enrollment settings in NVRAM. The Ethernet card does not reboot if you only change the enrollment settings.

**Note –** When you click the Commit button, only those fields with an active check box are updated.

### **Enroll**

After you commit your enrollment settings, click this button to enroll the drive.

### **Cancel**

Click this button to cancel all pending setting changes.

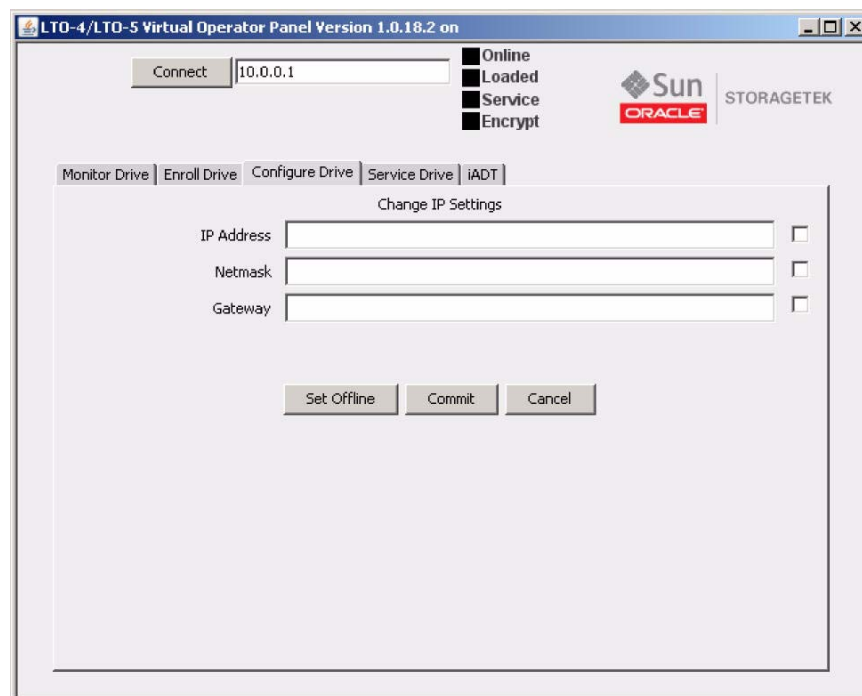
## Configure Drive

**Note** – Refer to your encryption documentation before using this page. The sequence for using the Configure Drive and Enroll Drive tabs is critical to success.

Click this tab to access functions used to specify IP settings for the tape drive. This page is typically used by the service representative to configure the tape drive to use settings other than those set during the manufacturing process.

The following figure shows an example of the Configure Drive page:

**FIGURE 10-4** LTO VOP Configure Drive tab



As shown in [FIGURE 10-4](#), this page includes fields to specify IP settings, and buttons to perform related operations.

To change a setting, enter a new value in a field. The accompanying Update check box is automatically selected to indicate a change.

## Fields

The Configure Drive page includes the following fields:

### IP Address

Enter the IP address for the tape drive.

### Netmask

Enter the Netmask for the tape drive.

### Gateway

Enter the Gateway for the tape drive.

## Buttons

The Configure Drive page includes the following buttons:

### Set Offline

Click this button to set the tape drive (adapter card) offline.

**Note –** The label on this button changes depending on the current drive state (for example, the label is Set Offline when the drive state is Online).

### Commit

Click this button to save the IP settings in NVRAM. The Ethernet card reboots when you change an IP setting.

**Note –** When you click the Commit button, only those fields with an active check box are updated.

### Cancel

Click this button to unselect all pending setting changes.

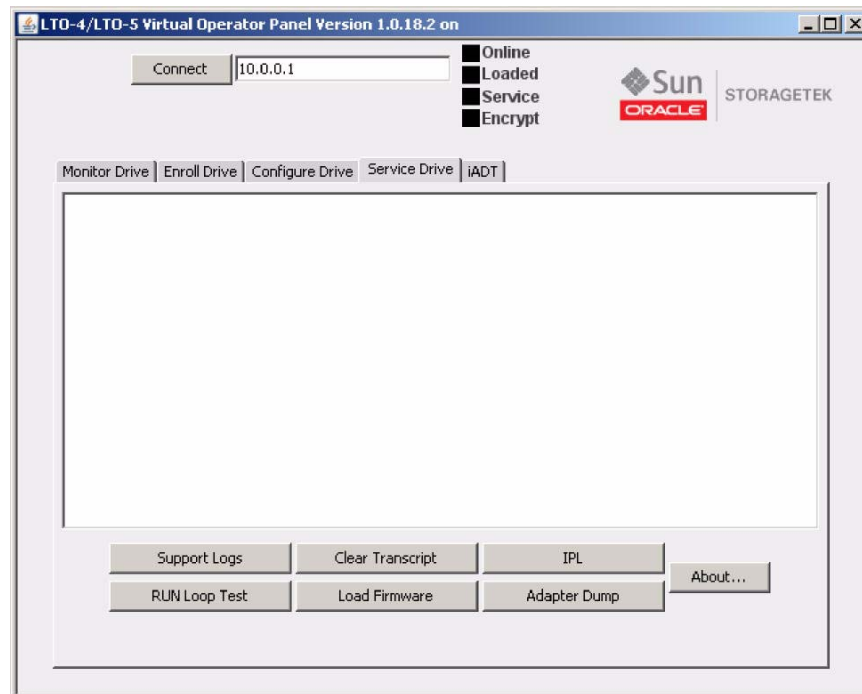
## Service Drive

**Note** – Refer to your encryption documentation before using this page.

Click this tab to access functions used to perform service functions on the tape drive. These functions are primarily intended for the service representative.

The following figure shows an example of the Service Drive page:

**FIGURE 10-5** LTO VOP Service Drive tab



As shown in [FIGURE 10-5](#), this page contains a text-based transcript area and the following buttons:

### Support Logs

Saves log files to a specified location.

### Clear Transcript

Erases the content displayed in the text pane.

### IPL

Performs an Initial Program Load (IPL) of the Ethernet card.

### Run Loopback Test

Performs an internal loopback test on the tape drive.

**Load Firmware**

Starts the Ethernet card firmware update procedure. You are prompted to identify the directory that contains the Ethernet card firmware files.

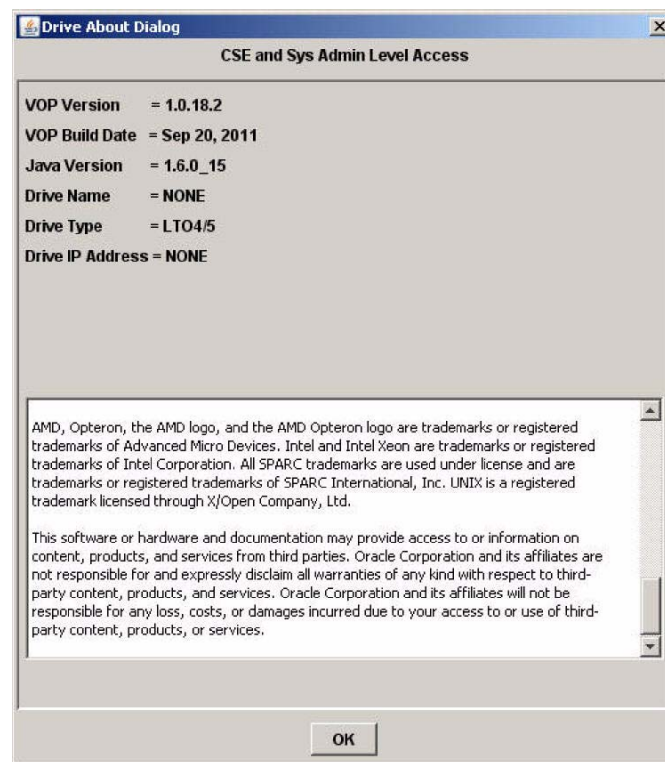
**Adapter Dump**

Saves the Ethernet card log file to a specified location.

**About**

Displays LTO VOP version, basic tape drive information, and copyright information. For example:

**FIGURE 10-6** LTO VOP About Dialog



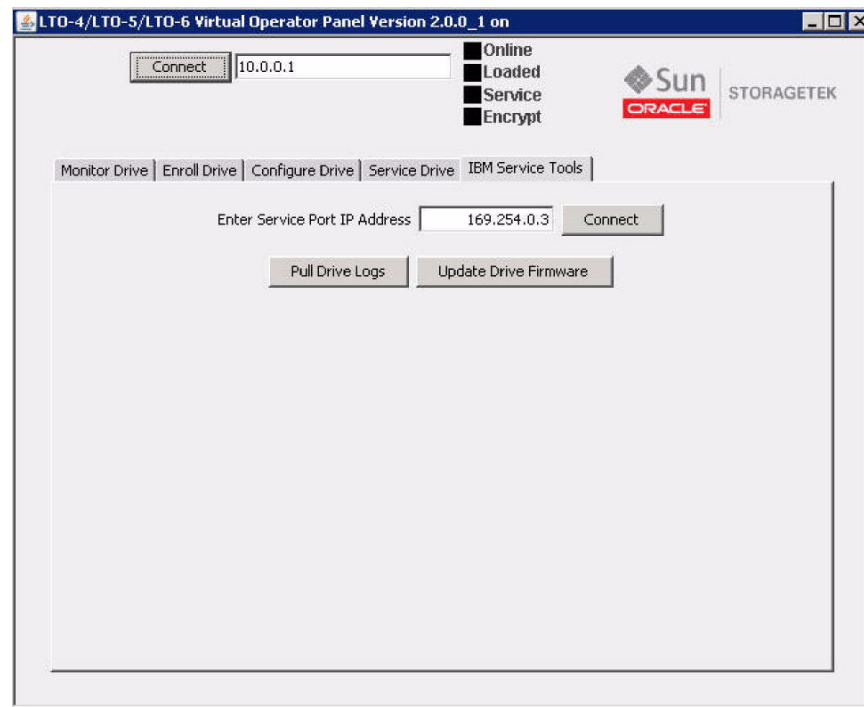
## IBM Service Tools

Click this tab to access functions used to perform service functions on an IBM LTO tape drive. These functions are primarily intended for the service representative.

**Note –** This tab is only available when you are connected to an IBM LTO tape drive. The LTO 5 tape drive has two ports, one for service and one labeled encryption. Use the service port to pull logs or update firmware.

The following figure shows an example of the IBM Service Tools page:

**FIGURE 10-7** LTO VOP IBM Service Tools tab



As shown in [FIGURE 10-7](#), this page contains the following buttons:

**Note –** The Service Port IP Address is displayed, but cannot be changed in this release.

### Pull Drive Logs

Saves log files to a specified location.

### Update Drive Firmware

Starts the Ethernet card firmware update procedure. You are prompted to identify the directory that contains the Ethernet card firmware files.



---

## Using 9XXX VOP

This chapter describes how to use the 9XXX Virtual Operator Panel (VOP) with a single T9840B, T9840C, T9940A, or T9940B tape drive.

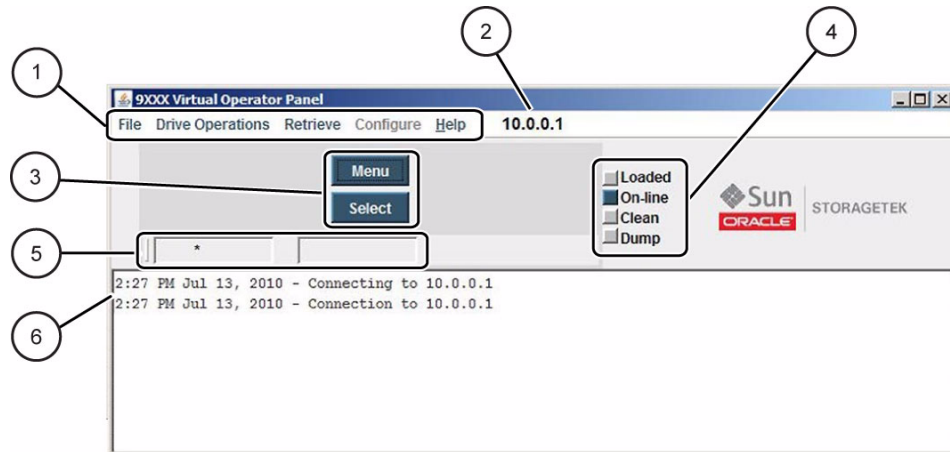
Designed for ease of use, the 9XXX VOP Graphical User Interface (GUI) allows you to do the following:

- Monitor tape drive status
- View or change tape drive configuration settings
- Perform tape drive operation utilities

## 9XXX VOP Interface

The following figure shows the 9XXX VOP main interface:

**FIGURE 11-1** 9XXX VOP Interface



1. Menus
2. Drive IP
3. Menu and Select Switches
4. Primary and Secondary Message Windows
5. Status Indicators
6. Transcript Pane

As shown in [FIGURE 11-1](#), the 9XXX VOP interface includes the following:

- **Menus**

Use menus to issue 9XXX VOP commands. See [“Using 9XXX VOP Menus” on page 129](#) for more information.

- **Drive IP**

Displays the IP address of the tape drive loaded.

- **Menu/Select Switches**

Use these switches to access the tape drive menu system. See [“Using Menu and Select Switches” on page 134](#) for more information.

- **Tape Drive Status Indicators**

These indicators show the current drive state:

- The **Empty/Loaded** status indicator indicates whether a tape cartridge is loaded in the tape drive. When you load a cartridge in the tape drive, this status indicator changes from grey to blue, and indicates Loaded.
- The **Online/Offline** status indicator indicates whether the Ethernet adapter card is online. When you bring a tape drive online, this status indicator changes from grey to blue, and indicates Online.
- The **Clean** status indicator indicates that the tape drive needs to be cleaned.

- The **Dump** status indicator indicates that a dump is present for retrieval.
- **Primary and Secondary Message Windows**  
Display status messages during 9XXX VOP processing.
- **Transcript Pane**  
Displays a transcript of 9XXX VOP actions and prompts for additional input or actions.

## Using 9XXX VOP Menus

9XXX VOP includes the following menus:

- [File Menu](#)
- [Drive Operations Menu](#)
- [Retrieve Menu](#)
- [Configure Menu](#)
- [Help Menu](#)

**Note** – Certain menus require the tape drive to be offline.

## File Menu

The File menu includes the following commands:

**Note** – File menu commands are available when the tape drive is either online or offline.

### Clear Transcript

Clears the entire 9XXX VOP transcript pane and closes the file menu.

### Connect to Drive

Connects 9XXX VOP to the tape drive.

When the authentication dialog box appears, enter the tape drive IP address and click OK.

**Note** – Optionally, you can use the SHIFT+C keyboard shortcut from the File menu to issue this command.

### Display 9XXX Logs from File

Displays tape drive logs from a specified file.

### Exit

Disconnects 9XXX VOP from the tape drive and closes the application.

**Note** – Allow a few seconds for the shutdown operation to complete.

## Drive Operations Menu

To open the Drive Operations menu, click Drive Operations in the menu bar or use the **ALT+D** keyboard shortcut.

**Note** – Refer to the *T9x40 Tape Drive User's Reference Manual* for additional information regarding the tape drive, use of a cartridge tape, and general operating procedures.

The Drive Operations menu includes the following commands:

**Note** – The tape drive must be encryption-enabled for some commands to appear.

### Unload Tape

Rewinds and unloads a loaded cartridge. A text pane message indicates that the tape cartridge is unloaded.

You must physically remove an unloaded cartridge from the tape drive by library robotics, or manually, from the rack mount configuration. Otherwise, the cartridge remains in the loading slot but is not loaded in the tape drive.

**Note** – Optionally, you can use the **SHIFT+U** keyboard shortcut to issue this command from the Drive Operations menu.

### IPL Drive

Performs a tape drive initial program load (IPL).

If the tape drive is online, a confirmation dialog box appears.

**Note** – During the IPL, VOP loses communication with the tape drive. Once the IPL is successfully completed, VOP automatically reconnects with the tape drive.

### Force Dump

Dumps the current contents of various drive registers to a file.

The tape drive stores the dump to internal memory, and the dump status indicator changes to orange. The forced dump operation causes a tape drive IPL, during which VOP loses connection with the tape drive. Once the IPL is successfully completed, FFFA appears in the secondary drive message window.

## Retrieve Menu

To open the Retrieve menu, click **Retrieve** in the menu bar or use the **ALT+R** keyboard shortcut.

The Retrieve menu includes the following commands:

### Dumps to File

Retrieves diagnostic dumps that are currently stored in the drive memory, and allows you to save the dumps in a specified location. After you save the dump file, an entry is displayed in the VOP transcript pane. For example:

```
8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:Dmp 1
8:55 AM Aug 2, 2010 - DUMP AVAILABLE: fffa:DMP 1
9:00 AM Aug 2, 2010 - Retrieve Dumps in Progress
9:00 AM Aug 2, 2010 - Dumps RETRIEVED to D:\T9840B_dump_aug2
```

### Logs to File

Retrieves event logs that are currently stored in the tape drive memory, and allows you to save the event logs in a specified location.

### Perms to File

Retrieves all the permanent errors that are currently stored in the tape drive memory, and allows you to save the error log in a specified location.

Retrieves a log containing non-dump events.

### Get and Display Logs

Retrieves and displays event logs that are currently stored in the tape drive memory.

### Delete Dumps

Deletes all diagnostic dumps from the tape drive.

### Delete Logs

Deletes all event logs from the tape drive.

### Delete Perms

Deletes all permanent errors from the tape drive.

**Note** – It is recommended that you save logs before deleting them, as they can help in troubleshooting tape drive issues.

## Configure Menu

**Note –** With the exception of the Set Clock command, these commands are only available when the tape drive is offline. The tape drive should not be available to the host when you exercise any change that results in the tape drive performing an Initial Program Load (IPL) to implement the configuration change.

The Configure menu includes the following commands:

### Set Clock

Sets the tape drive's internal clock to the current time in your computer. Once the clock is set, an entry is displayed in the VOP transcript pane.

### Code Load from File

Loads firmware from a user-specified file to a tape drive. See [“File Menu” on page 129](#) for more information.

## ▼ To Load Drive Firmware

Use 9XXX VOP menus, 9XXX VOP controls, and the tape drive menu system to load drive firmware.

1. **From the 9XXX interface, click the Menu button to enter the tape drive menu system.**

The primary message window displays Online, and the status indicator is blue.

2. **Click the Select button to place the tape drive in an Offline state.**

The primary message window displays Offline, and the status indicator changes to grey.

3. **Click the Configure menu and select Code Load from File.**

The Open dialog box appears.

4. **Locate the firmware file and click the Open button.**

The 9XXX transcript pane displays START Code Load from File. As the process continues, the transcript displays additional messages regarding the code load, IPL, and re-connection to 9XXX VOP.

**Note –** The code load process may take several minutes.

5. **Click the Menu button to display the code version in the primary message window.**
6. **Use the Menu and Select buttons to exit the drive menu system.**
7. **Click on the File menu and select Exit.**
8. **Disconnect the crossover Ethernet cable from the tape drive Ethernet port.**
9. **Set your PC to obtain an IP address automatically.**

## Help Menu

To open the Help menu, click **Help** in the menu bar or use the **ALT+H** keyboard shortcut.

**Note** – Help menu commands are available when the tape drive is either online or offline.

The Help menu includes the following commands:

### About

Displays a dialog box that provides the following information about the 9XXX application and environment.

- Role level access
- VOP Version (single tape drive application)
- VOP Build Date (single tape drive application)
- Drive Name (if a tape drive is connected)
- Drive Type (if a tape drive is connected)
- Java Version
- License Agreement

**Note** – Optionally, you can use the **SHIFT+A** keyboard shortcut to issue this command from the Help menu. To close the dialog, click **OK** or use the **ALT-O** keyboard shortcut.

### FSC Dictionary

Opens the FSC Look Up dialog box, used to perform a lookup in the Fault System Code (FSC) Dictionary.

**Note** – The FSC Dictionary is available with or without a tape drive connection.

When the FSC Look Up dialog box appears, enter an FSC number, select the dictionary for the tape drive model, and click the **LOOKUP** button. The fault system code description is displayed in the VOP transcript pane. For example:

```
FSC: A33A | NO TAPE IS          | LOADED          | ***
MIM Code: NONE
```

```
FRU:          OPER.  ERROR CONF: 100%
```

Field Text:

The user requested motion operation that requires a tape to be installed, however, a tape has not been loaded.

## Using Menu and Select Switches

The portion on the 9XXX interface between the menu bar and transcript pane contains elements designed to mimic the physical operator panel on a 9x40 tape drive.

Use the Menu and Select buttons to access the tape drive's menu system.

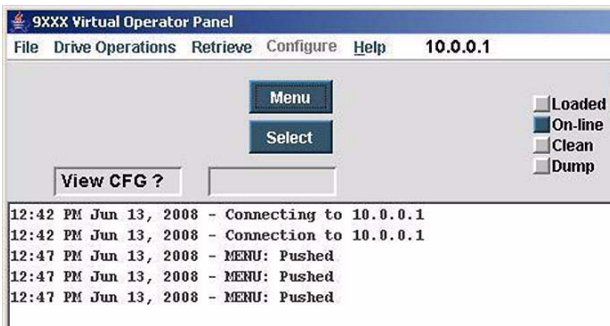
**Note** – It is assumed that you fully understand the tape drive menu system. Refer to the *T9x40 Tape Drive Service Reference Manual* for a detailed description of the drive menu system.

### Menu Button

Click the **Menu** button to enter the drive menu system or advance to the next portion of the drive menu system. Menu options and values display in the primary message window.

For example:

**FIGURE 11-2** 9XXX VOP Menu Switch



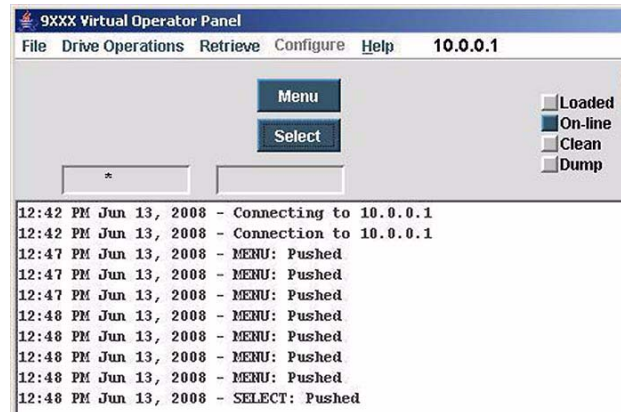
As shown in [FIGURE 11-2](#), the Menu button has been clicked several times and View CFG? appears in the primary message window.

## Select Button

Click the **Select** button to advance to the next available menu option or value, to enter a submenu (such as View CFG?), or to exit from either a submenu or the main menu system.

For example:

**FIGURE 11-3** 9XXX VOP Select Switch



As shown in [FIGURE 11-3](#), the Select button has been clicked, resulting in an exit from the main menu system. An asterisk (\*) appears in the primary message window.



---

## Changing the Default MD-VOP User File Directory

By default, MD-VOP stores user created files under the *User* home directory, in a sub-directory called `.mdvop`.

You can edit the MD-VOP launch scripts as follows to override the default home directory where the `.mdvop` directory resides.

### Windows

Access the MD-VOP executable file, `mdvop.bat`, in a text editor and insert the following statement in both entries:

```
-Dapplication.user.home=<new root path>
```

**Note** – Substitute your new directory path for *new root path*.

In the following example, the inserted statements are shown in bold:

```
start %javalocation% -classpath %classpatha% -  
Dapplication.user.home=<new root path> -  
Djava.security.policy=rmi.policya %policya% -view  
  
start %javalocation% -classpath %classpatha% -  
Dapplication.user.home=<new root path> -  
Djava.security.policy=rmi.policya %policya% -view %1
```

# UNIX

Access the MD-VOP executable file, `mdvop`, in a text editor and insert the following statement in the first two entries:

```
-Dapplication.user.home=<new root path>
```

**Note –** Substitute your new directory path for *new root path*.

In the following example, the inserted statements are shown in bold:

```
${javalocation} -classpath "${startlib}" -  
Dapplication.user.home=<new root path> -  
Djava.security.policy=${policycurrent} -cse  
  
${javalocation} -classpath "${startlib}" -  
Dapplication.user.home=<new root path> -  
Djava.security.policy=${policycurrent} -cse ${properties} &
```

**Note –** You do not need to edit the third entry.

---

---

## Glossary

This glossary defines terms and abbreviations in this publication.

Some of the definitions are taken from other glossaries. The letters in the parentheses that follow some definitions indicate the source of the definition:

**(A)** *The American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI).

**(E)** The ANSI/Electronic Industries Association (EIA) Standard-440-A, *Fiber Optic Terminology*.

**(I)** *The Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and International Electrotechnical Commission (ISO/IEC/JTC1/SC1).

**(IBM)** *The IBM Dictionary of Computing*, copyright 1994 by IBM.

**(T)** Draft international standards committee drafts, and working papers being developed by the ISO/IEC/JTC1/SC1.

### A

#### **address**

A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A).

#### **alphanumeric**

A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A).

### C

#### **capacity**

Total amount of User Data stored on one data cartridge in 8 bit bytes. *Synonymous with "User Capacity" or "Native Capacity"*. This is the capacity that the user sees after the ECC/Format/ERP etc. overhead has been assessed (no compression).

#### **capacity, raw**

Total amount of data stored on one data cartridge in 8 bit bytes before any ECC/Format/ERP etc. overhead has been assessed (no compression).

**capacity, user**

Total amount of data stored on one data cartridge in 8 bit bytes that is sent by the host computer. This is the capacity that the user sees after the ECC/Format/ERP etc. overhead has been assessed (no compression).

**cartridge**

A storage device that consists of magnetic tape on supply and takeup reels, in a protective housing. (IBM)

**cleaning cartridge**

A data cartridge that contains special material to clean the tape path in a transport or drive.

**compress**

To save space by eliminating gaps, empty fields, redundancy, or unnecessary data to shorten the length of records or files. (IBM)

**configuration**

The manner in which the hardware and software of an information processing system is organized and interconnected. (T)

**connector**

An electrical or optical part that joins two or more other parts.

## D

**data cartridge**

A container holding magnetic tape that can be processed without separating the tape from the container.

**data path key management (DPKM)**

The use of the SCSI 4 commands *Security Protocol In* and *Security Protocol Out* to implement host-based key management encryption on StorageTek tape drives.

**data security erase (DSE)**

A random binary pattern, over-writing existing data, from the point of an Erase command, to the end-of-tape.

**data tape**

A data cartridge formatted for use as a regular data tape for the system in which it is used.

**data track(s)**

The region(s) of recorded tape containing user data formed as discreet longitudinal "tracks" (similar to railroad tracks).

**diagnostics**

Pertaining to the detection and isolation of errors in programs and faults in equipment. (IBM)

**DPKM**

See data path key management.

**drive**

A device for moving magnetic tape and controlling its movement. (IBM)

**dump**

To copy the contents of all or part of virtual storage to collect error information. (IBM)

## E

### **emulation**

The use of programming techniques and special machine features to permit a computing system to execute programs written for another system. (IBM)

### **encryption**

The translation of data into a secret code. Encryption is one of the most effective ways to achieve data security. To read an encrypted file, you must have access to a special key or password that enables you to decipher it.

### **EOT**

End of Tape.

### **erase**

To remove data from a data medium, leaving the medium available for recording new data. (I) (A)

### **error**

A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition. (I) (A)

### **ESD**

Electrostatic Discharge.

## F

### **fault symptom code (FSC)**

A four-character hexadecimal code generated in response to an error to help isolate failures within the device.

### **FC**

See *fibre channel*.

### **fiber optics**

The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. (E)

### **fiber-optic cable**

A cable made of ultrathin glass or silica fibers which can transmit data using pulses of laser light. Fiber-optic cables have several advantages over copper cables: they have much less signal loss; they allow information to be transmitted at higher speeds and over longer distances; they are not affected by external electrical noise; and they are better for transmissions which require security.

### **fibre channel**

The National Committee for Information Technology Standards standard that defines an ultrahigh-speed, content-independent, multilevel data transmission interface that supports multiple protocols simultaneously. Fibre Channel supports connectivity to millions of devices over copper and/or fiber-optic physical media and provides the best characteristics of both networks and channels over diverse topologies.

**fibre connection (FICON)**

An ESA/390 and zSeries computer peripheral interface. The I/O interface uses ESA/390 and zSeries FICON protocols (FC-FS and FC-SB-2) over a Fibre Channel serial interface that configures units attached to a FICON-supported Fibre Channel communications fabric.

**FICON**

See *fibre connection (FICON)*.

**FICON channel**

A channel having a Fibre Channel connection (FICON) channel-to-control-unit I/O interface that uses optical cables as a transmission medium.

**file-protect**

To prevent the erasure or overwriting of data stored on data cartridges.

**FIPS**

Federal Information Processing Standards

**FRU**

Field Replaceable Unit.

**FSC**

Fault Symptom Code.

**FTP**

Generic definition: File Transfer Protocol.

## G

**GB**

See *gigabyte (GB)*.

**Gb**

Gigabit, equal to  $10^9$  bits.

**Gbps**

Gigabits per second.

**gigabyte (GB)**

One billion ( $10^9$ ) bytes.

## H

**hardware**

All or part of the physical components of an information processing system, such as computers or peripheral devices. (T) (A)

**hub**

A Fibre Channel Arbitrated Loop switching device that allows multiple servers and targets, such as storage systems, to connect at a central point. A single hub configuration appears as a single loop.

## I

### **indicator**

A device that provides a visual or other indication of the existence of a defined state. (T)

### **interface**

Hardware, software, or both, that links systems, programs, or devices. (IBM)

### **internet protocol (IP)**

A protocol used to route data from its source to its destination in an Internet environment. (IBM)

### **internet protocol (IP) address**

A four-byte value that identifies a device and makes it accessible through a network. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be from 0 to 255. For example, 129.80.145.23 could be an IP address.

### **IP**

See [internet protocol \(IP\)](#)

### **internet protocol v4 (IPv4) address**

A four-byte value that identifies a device and makes it accessible through a network. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be from 0 to 255. For example, 129.80.145.23 could be an IP address.

### **internet protocol v6 (IPv6) address**

The next generation internet protocol. It provides a much larger address space than IPv4. This is based upon the definition of a 128-bit address - IPv4 used a 32-bit address. The IPv6 address format is eight fields of four hexadecimal characters separated by colons (for example, 2001:0db8:85a3:0000:0000:8a2e:0370:7334)

## L

### **library**

A robotic system that stores, moves, mounts, and dismounts data cartridges that are used in data read or write operations.

### **Linear Tape-Open (LTO)**

A set of data format standards created to enable data interchange among tape drive produced by a consortium of manufacturers. With LTO standards, the tape cartridges are interchangeable among tape drive brands.

### **link**

A physical connection (electrical or optical) between two nodes of a network.

## M

### **magnetic tape**

A tape with a magnetizable layer on which data can be stored. (T)

### **menu**

A list of options displayed to the user by a data processing system, from which the user can select an action to be initiated. (T)

## N

### **network**

An arrangement of nodes and branches that connects data processing devices to one another through software and hardware links to facilitate information interchange.

## O

### **offline**

Neither controlled by, nor communicating with, a computer. (IBM)

For a tape drive, this indicates that the tape drive is communicating, but reading/writing of data cannot be sent.

### **online**

Pertaining to the operation of a functional unit when under the direct control of the computer. (T)

For a tape drive, this indicates that the tape drive is communicating and all data can be sent.

## P

### **performance**

One of two major factors, together with facility, on which the total productivity of a system depends. Performance is largely determined by a combination of throughput, response time, and availability. (IBM)

## R

### **read/write head**

The data sensing and recording unit of a diskette magazine drive or tape drive. (IBM)

### **release**

A distribution of a new product or new function and fixes for an existing product. (IBM)

### **R/W**

Read/Write.

## S

### **SDP**

Service Delivery Platform.

### **submenu**

A menu related to and reached from a main menu. (IBM)

### **sub-system**

A system that is part of some larger system.

### **switch**

In Fibre Channel technology, a device that connects Fibre Channel devices together in a fabric.

### **system**

A combination of functionally interrelated interacting mechanical and electrical elements designed to work as a coherent entity.

## T

### **T10000 Tape Drive (VOP)**

A software application that allows a user to monitor and perform some operations on a tape drive.

### **tape**

*See* magnetic tape.

### **tape cartridge**

A container holding magnetic tape that can be processed without separating the tape from the container.

### **tape drive**

A device for moving magnetic tape and controlling its movement. (T)

### **TCP/IP**

Transmission Control Protocol/Internet Protocol

### **transmission control protocol/internet protocol (TCP/IP)**

A set of communication protocols that support peer-to-peer connectivity functions for both local and wide area networks. (IBM)

## U

### **Ultrium**

An LTO tape format optimized for high capacity and performance with outstanding reliability. The Ultrium tape format uses a single reel cartridge to maximize capacity.

## V

### **VOLSER**

VOLume SERial Number. It is, usually 6 characters long and is both the paper label stuck on the back edge of the cartridge and in the VOLID label that is recorded, particularly by MVS systems, at the beginning of the media.

### **volume serial number (VOLSER)**

An alphanumeric label that the host software uses to identify a volume. It attaches to the spine of a cartridge and is both human- and machine-readable.

### **VOP**

See *T10000 Tape Drive (VOP)*.

## W

### **wrap**

A single pass of tape from either BOT to EOT or EOT to BOT with the head(s) in a fixed transverse location.

### **write-enabled**

A setting on a data cartridge that allows data to be written on the tape.

### **write-protected**

A setting on data cartridges that prevents data from being written on the tape. Reading data is still possible.

---

# Index

## Numerics

---

- 9XXX VOP
  - drive support 19
  - interface 128
  - menu and select switches 134
  - menus 129
  - overview 127
  - starting 33, 128

## A

---

- About 112
  - button, LTO VOP 124
  - command, 9XXX VOP 133
  - command, MD-VOP 59
  - command, T10000 9840D VOP 112
- ASR
  - Activate 54
  - Creation 55
  - Log 55
  - Register 53
  - Test 55
- ASR drive support, MD-VOP 18
- ASR view, MD-VOP 52

## C

---

- changing the computer IP address 137
- Clear All Drive Transcripts 82
- Clear Library Transcript 82
- Clear Spreadsheet 67
- Clear Transcript 96, 129
- Code Load from file 132
- Collect Support Logs 96
- commands
  - 9XXX VOP
    - Clear Transcript 129
    - Code Load from file 132
    - Connect to Drive 129
    - Delete Dumps 131
    - Delete Logs 131
    - Delete Perms 131
    - Display 9XXX Logs from File 129

- Dumps to File 131
- Exit 129
- Force Dump 130
- Get and Display Logs 131
- IPL Drive 130
- Logs to File 131
- Perms to File 131
- Set Clock 132
- Unload Tape 130
- MD-VOP
  - About 59
  - Clear All Drive Transcripts 82
  - Clear Library Transcript 82
  - Compare OKM Spreadsheet and Drives in This Library 89
  - Contact Support 59
  - Create OKM Agents in This Library 88
  - Create Spreadsheet Template 89
  - Create Spreadsheet Template with Agent Lookup 89
  - Delete All Logs in This Library 84
  - Delete Dump Logs in This Library 84
  - Delete Event Logs in This Library 84
  - Delete Perm Logs in This Library 84
  - Drive Status Report 92
  - Edit Configuration 57
  - Encryption Report 92
  - Enroll Drives in This Library 88
  - Exit 59
  - Firmware Update from File in This Library 85
  - Get Logs for Support 58
  - Health Analysis of Selected Drives in This Library 83
  - Health Report 92
  - IPL Selected Drives in This Library 83
  - Launch Configuration 57
  - License Drives in This Library 89
  - Load Tape Cartridges in This Library 83
  - Modify OKM Agents in This Library 88
  - Reconnect to Selected Drives in This Library 82
  - Reconnect to Unconnected Drives 82

- Refresh Icons in the Library 82
  - Retrieve All Logs in This Library 84
  - Retrieve Dump Logs in This Library 84
  - Retrieve Event Logs in This Library 84
  - Retrieve ID Files in This Library 84
  - Retrieve Perm Logs in This Library 84
  - Set Clocks in This Library 85
  - Set Default Configuration 57, 58
  - Set Drives to Unencrypting in This Library 89
  - Set Selected Drives Offline in This Library 83
  - Set Selected Drives Online in This Library 83
  - Unenroll Drives in This Library 88
  - Unload Tape Cartridges in This Library 83
  - MD-VOP Configuration Screen
    - Clear Spreadsheet 67
    - Delete Configuration File 66
    - Edit Configuration Dialog 66
    - Launch 66
    - New Configuration 66
    - Open Configuration 66
    - Probe Complex (SL8500 Only) 67
    - Probe for Drive Location 67
    - Probe IP Addresses in Spreadsheet 67
    - Save 66
    - Save as 66
    - Scan Tray Serial Numbers 67
    - Set as Default Configuration 66
    - Unset Default Configuration 66
  - T10000 9840D VOP
    - Clear Transcript 96
    - Collect Support Logs 96
    - Connect to Drive 96
    - Drive Data 103
    - Dumps to File 102
    - Exit 96
    - Firmware Update from file 103
    - Firmware Update from Tape 103
    - Force Dump 98
    - Format Tape 98
    - ID File to File 102
    - Identify Drive Off 98
    - Identify Drive On 98
    - IPL Drive 97
    - Load Tape 97
    - Logs to File 103
    - Perms to File 102
    - Reset Drive 98
    - Save Drive Config 103
    - Set Clock 103
    - Set Offline/Online 97
    - Set Power Active 98
    - Set Power Hibernate 98
    - Unload Tape 97
    - View Date & Time 102
    - View Drive Data 101
  - Compare OKM, Spreadsheet, and Drives in This Library 89
  - Configuration menu
    - MD-VOP 85
    - T10000 9840D VOP 103
  - Configure Drive function tab, LTO VOP 121
  - Configure Drive Parameters dialog
    - buttons
      - Cancel 106
      - Commit 106
      - Load Drive Config 106
    - drive data settings
      - Data Compression 107
      - Data Security Erase 107
      - Emulation 107
      - Library Address 108
      - Standard Label Protect 107
      - Tape Completion Display 108
    - Encrypt 104
    - Fibre 104
    - Network 105
    - Power 105
    - Security 105
  - Configure Drive Parameters dialog drive data settings
    - Interface Port Attributes 109
    - Language 108
    - World Wide Name 109
  - Configure menu
    - 9XXX VOP 132
  - Connect to Drive 96, 129
  - considerations, configuration 19
  - considerations, firmware update 85
  - Contact Support 59
  - Create 88
  - Create OKM Agents in This Library 88
  - Create Spreadsheet Template 89
  - Create Spreadsheet Template with Agent Lookup 89
- ## D
- 
- dashboard menus 57
  - dashboard, MD-VOP 37
  - default file directories 23
  - default settings
    - Drive Health Display Settings 79
    - Drive State Display Settings 76
    - Encryption Display Settings 78
    - Misc Display Settings 75

- Delete All Logs in This Library 84
- Delete Configuration File 66
- Delete Dump Logs in This Library 84
- Delete Dumps 131
- Delete Event Logs in This Library 84
- Delete Logs 131
- Delete Perm Logs in This Library 84
- Delete Perms 131
- Display 9XXX Logs from File 129
- Drive Data 103
- drive details, MD-VOP 40
- drive health view, MD-VOP 48
- Drive Operations menu
  - 9XXX VOP 130
  - MD-VOP 83
  - T10000 9840D VOP 97
- drive requirements 16
- drive state view, MD-VOP 44
- Drive Status Report 92
- drive support
  - 9XXX VOP 19
  - LTO VOP 18
  - MD-VOP 17
  - T10000 9840D VOP 18
- drive views, MD-VOP 43
- Dumps to File 102, 131

## E

---

- Edit Configuration 57
- Edit Configuration Dialog 66
- encryption command requirements 90
- Encryption menu 88
- Encryption Report 92
- encryption requirements
  - OKM data file 90
- encryption view, MD-VOP 46
- Enroll Drive function tab, LTO VOP 119
- Enroll Drives in This Library 88
- Exit 59, 96, 129

## F

---

- File menu
  - 9XXX VOP 129
  - MD-VOP
    - Dashboard 57
    - Library Panel 82
    - Reports 92
    - T10000 9840D VOP 96
- firmware update
  - considerations 85
  - procedure 86

- Firmware Update from file 103
- Firmware Update from File in This Library 85
- Firmware Update from Tape 103
- Force Dump 98, 130
- Format Tape 98
- FSC Dictionary command
  - 9XXX VOP 133
- function tabs, LTO VOP
  - Configure Drive 121
  - Enrol Drive 119
  - IBM Service Tools 125
  - Monitor Drive 117
  - Service Drive 123

## G

---

- Get and Display Logs 131
- Get Logs for Support 58

## H

---

- Health Analysis of Selected Drives in This Library 83
- Health Report 92
- Help menu
  - 9XXX VOP 133
  - MD-VOP
    - Dashboard 59
    - T10000 9840D VOP 112

## I

---

- IBM Service Tools function tab, LTO VOP 125
- ID File to File 102
- Identify Drive Off 98
- Identify Drive On 98
- installing VOP 23
- interface
  - 9XXX VOP 128
  - LTO VOP 114
  - MD-VOP 35
  - T10000 9840D VOP 94
- IPL Drive 97, 130
- IPL Selected Drives in This Library 83

## J

---

- Java requirement 16

## L

---

- Launch 66
- Launch Configuration 57
- legend, MD-VOP 40
- library panel menus 81

- library panel, MD-VOP 39
- library requirements 16
- library spreadsheet 62
- library support, MD-VOP 16
- Library Utilities Menu 68
- License Drives in This Library 89
- Load Tape 97
- Load Tape Cartridges in This Library 83
- Logs to File 103, 131
- LTO VOP
  - drive support 18
  - interface 114
  - overview 113
  - starting 32, 33, 114

## M

---

- MD-VOP
  - ASR drive support 18
  - dashboard 37
  - dashboard menus 57
  - default settings, changing 74
  - drive details 40
  - drive support 17
  - drive views 43
  - interface 35
  - launching for first time 30
  - legend 40
  - library panel 39
  - library panel menus 81
  - library spreadsheet 62
  - library support 16
  - overview 13
  - placeholder drive support 17
  - probes 69
  - starting 29
  - stopping 114
- MD-VOP Configuration Screen
  - Library Utilities Menu 68
- Menu switch, 9XXX VOP 134
- menus
  - 9XXX VOP
    - Configure 132
    - Drive Operations 130
    - File 129
    - Help 133
    - Retrieve 131
  - MD-VOP
    - Dashboard
      - File 57
      - Help 59
    - Library Panel
      - Configuration 85

- Drive Operations 83
- Encryption 88
- File 82
- Reports 92
- Retrieve 84
- T10000 9840D VOP
  - Configuration 103
  - Drive Operations 97
  - File 96
  - Help 112
  - Retrieve 101
- Modify OKM Agents in This Library 88
- Monitor Drive function tab, LTO VOP 117

## N

---

- New Configuration 66

## O

---

- obtaining VOP 21
- OKM data file 90
- Open Configuration 66
- operating system requirements 15
- Oracle support 20
- overview
  - 9XXX VOP 127
  - LTO VOP 113
  - MD-VOP 13
  - T10000 9840D VOP 93

## P

---

- performing firmware update 86
- Perms to File 102, 131
- placeholder drive support, MD-VOP 17
- placeholder tape drive requirements 17
- Probe Complex (SL8500 Only) 67
- Probe for Drive Location 67
- Probe IP Addresses in Spreadsheet 67
- probes
  - Library Probe Operations Menu 69, 70
    - Detect and Place Drives Manually 71
    - Place by Drive Library Location 72
    - Place manually 71
    - Sequential IP Drive Placement 73
- publications, related 20

## R

---

- Reconnect to Selected Drives in This Library 82
- Reconnect to Unconnected Drives 82
- Refresh Icons in the Library 82
- related publications 20

requirements

- Java 16

- library and tape drive 16

- placeholder tape drive 17

- system 15

- tape drive 17

Reset Drive 98

Retrieve All Logs in This Library 84

Retrieve Dump Logs in This Library 84

Retrieve Event Logs in This Library 84

Retrieve ID Files in This Library 84

Retrieve menu

- 9XXX VOP 131

- MD-VOP 84

- T10000 9840D VOP 101

Retrieve Perm Logs in This Library 84

roles, user 15

## S

---

Save 66

Save as 66

Save Drive Config 103

Scan Tray Serial Numbers 67

SDVOP view, MD-VOP 51

Select switch, 9XXX VOP 135

Service Drive function tab, LTO VOP 123

service network 19

Set as Default Configuration 66

Set Clock 103, 132

Set Clocks in This Library 85

Set Default Configuration 57, 58

Set Drives to Unencrypting in This Library 89

Set Offline/Online 97

Set Power Active 98

Set Power Hibernate 98

Set Selected Drives Offline in This Library 83

Set Selected Drives Online in This Library 83

starting

- 9XXX VOP 33, 128

- LTO VOP 32, 33, 114

- MD-VOP 29

- T10000 9840D VOP 31, 94

stopping MD-VOP 114

support, obtaining 20

system requirements 15

## T

---

T10000 9840D VOP

- drive support 18

- interface 94

- overview 93

- starting 31, 94

tape drive requirements 16, 17

transcript, MD-VOP 50

## U

---

Unenroll Drives in This Library 88

uninstalling VOP 28

Unload Tape 97, 130

Unload Tape Cartridges in This Library 83

Unset Default Configuration 66

updating firmware 85, 86

user roles 15

## V

---

View Date & Time 102

View Drive Data 101

VOP

- default file directories 23

- installing 23

- obtaining 21

- starting applications 29

- support 20

- uninstalling 28

- user roles 15

